APRIL 1961

THE MAGAZINE OF APPLIED TECHNOLOGY FOR MEN WHO MANAGE

FOOD PROCESSING®

★ *Spotlight on Ingredients* begins on page 120

Superior product and no longer 5 days' processing, now . . .

SEED TO SALAD OIL 18 HOURS

page 38

Urge shift to polyunsaturated fats— who and why . . . 144

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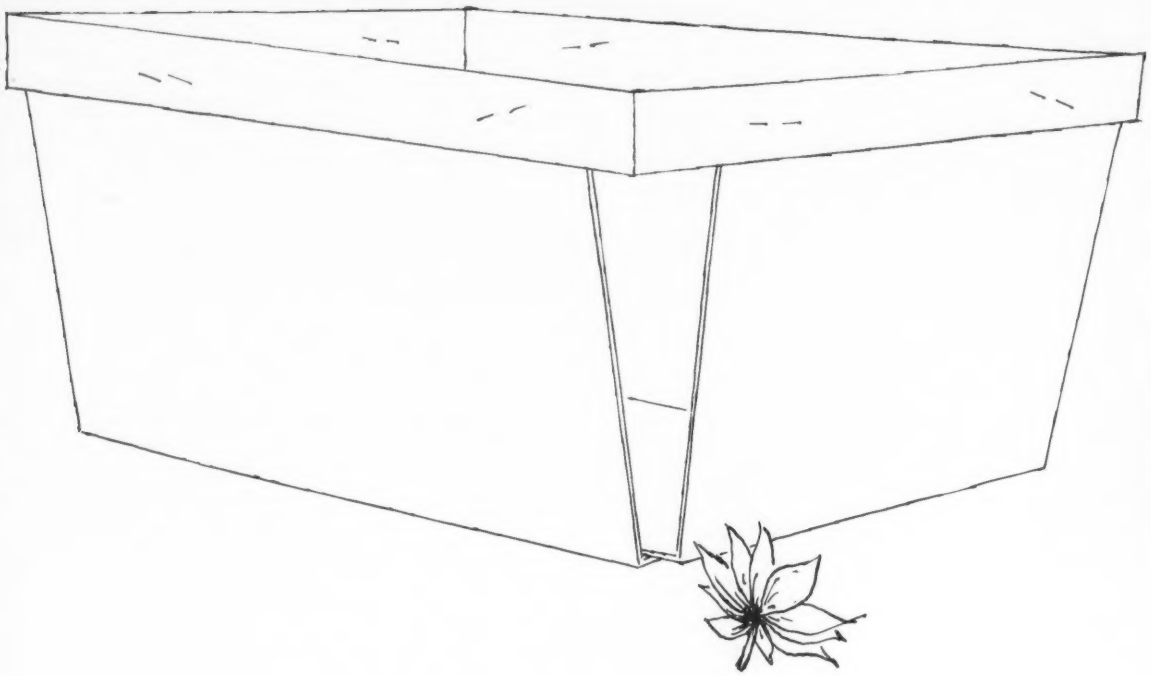
"Executive Magazines for Industry"

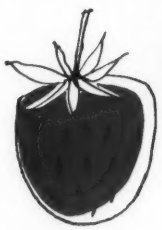


When all is said and done...

...NOTHING

TASTES SO TRUE

TO NATURE



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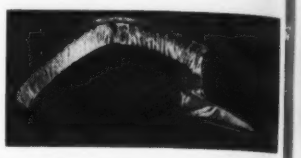
6294 on Reader Service Slip.

that's interesting

Throw-away foil fry pan

Scouring, messy clean-up and pan storage space — all banes of the American hausfrau through the years — are eliminated like magic by the shiny new frying pan shown. Once used, it can simply be thrown away — a special advantage when picnicing.

Strong enough to hold two lb of product, the foil pan



provides approximately a six-by-seven-in. cooking surface, plus a safe, strong handle.

Price to food processors of six to eight cents apiece (depending on quantity) makes it attractive for specialty products firms as a sales-stimulating combination package-premium, according to Ekco-Alcoa Containers Inc., Wheeling & Hintz Roads, Wheeling, Ill.

6295 on Reader Service Slip.

Scientists have done it! An unshrinkable hamburger

Intrepid scientists at Armour & Co. have resolved a major culinary dilemma: hamburger patties that shrink during cooking so as to look silly on the buns they're intended for. Armour has produced Sta-Big quick-frozen patties, made by a special process and under strict fat content control, to prevent horizontal cooking shrinkage.

Armour says its tests show that conventional chopped beef patties shrink ⅞ inch in diameter during cooking, while its Sta-Big patties actually increase in diameter by 3/16 inch in cooking.

How this is done is partly explained by fact that Sta-Big patties shrink in thickness by 2/16 inch during cooking, while conventional patties increase in thickness by 1/16 inch.

GO MODERN—profit with the wholesome milk product that boosts appetite appeal...builds brand loyalty! Valley Fresh Sweet Dairy Whey, an excitingly different milk product, contributes bonus flavor, texture, shelf life and nutrition to almost every known food item...at lower cost. ✚ This 100% pure dairy ingredient provides a higher content of Lactose than any other fraction of milk. It is also rich in milk's preferred protein, Lactalbumin, and other important milk solids. ✚ Valley Fresh Sweet Dairy Whey can help you improve present products...play a vital part in new product development. And you can count on skilled and extensive technical assistance. ✚ For complete details and samples, get in touch with Western, world-wide supplier of quality milk products. Write or phone today.

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Division of Foremost Dairies, Inc.

Foremost

Better than flypaper

Self-annihilation of house flies and fruit flies as result of chemical sterilization, tried by USDA entomologists for the first time, was successful with both male and female flies. Only small quantities of the chemical mixed in the flies' food produces permanent sterility.

Global greenmarket

Uncle Sam is the world's largest exporter of farm products. In fiscal 1960, we exported the output of 57 million acres, or one acre of every six of harvested cropland.

Milk . . . schmilk!

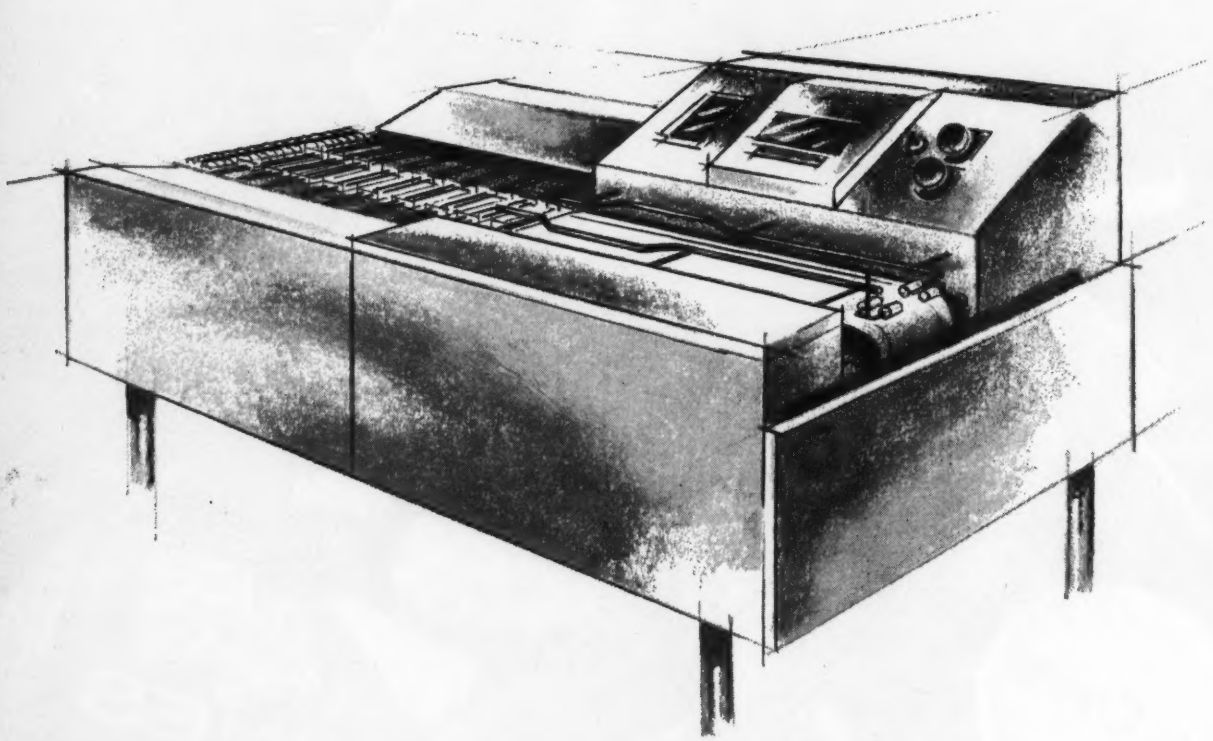
Root beer flavored milk is being test-marketed in the Los Angeles area by the joint developers — Dad's Root Beer Co., Chicago, and Carnation Milk Co. Product is available in half-gal cartons imprinted with names of both firms, and sells for about 55 cents.

For more information on product at right, circle 6296 see information request blank opposite last page.

Automatic Weighing IN MOTION with Featherweight Accuracy

When the line runs, capacity counts! Illumitronic Checkweighers, Weight Classifiers and Monitors, weighing in motion, combine speed with featherweight accuracy for economies up to 50% over halt-and-hurry hand weigh methods. Our equipment automatically weighs packages to 10 pounds, with continuous flow speeds to 300 units per minute. Accuracy ±1/30th of 1 ounce; range adjustable from 1/10th of 1 ounce to 2 ounces. Multiple channels for 2, 3, and 5-way classifying of cartons, bags, pouches, overwraps, cans, tubes. These machines are at work withstanding environmental conditions of production lines in frozen, canned and dried foods, meat processing, dietary supplements, dry and liquid detergents and others. Want to know how and where? Drop us a line or pick up the phone and dial 415, RE 9-2395.

Canner? Ask about our high-speed wrap-around label inspection equipment!



illumitronic systems corporation
680 east taylor • sunnyvale, california

6297 on Reader Service Slip.

over the editor's shoulder

Shutter-bugging

The Ranchers' job (see page 38) was typically trying, photographically speaking. Because of the hexane hazard, no flash could be used. The entire Ranchers refinery is open air construction, which helped the no-flash restriction, although shadows toward the center of the tightly packed equipment were dense and required careful choice of angle.

A foggy day complicated matters. When I arrived in Fresno I circled the plant twice before I found it in the heavy fog.

The fog continued until mid-afternoon. Then it parted and a thin, watery sun came out.

Shortly after three p.m., just as I finished the last shot, the sun disappeared again, and I drove home through another veil of fog.

Highly unusual for California, I might add.

For you camera enthusiasts, the Ranchers Cotton Oil article marks a changeover for me from an Exakta VX (automatic f 1.9 Xenon) to a Rolleiflex (f 2.8 Planar). We are constantly searching for new ways to achieve maximum photo quality and still maintain the portability required by air travel and the necessity for quick shooting without disrupting plant production.

Our staff has tried practically every camera commonly used, including the 4 x 5 press types, Leica M3, Hasselblad and others. The Rollei has emerged as my choice for all round print quality and dependability.

Karl Ross
ASSOCIATE EDITOR

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE

APRIL 1961
VOL. 22 NO. 4

FOOD PROCESSING

CIRCULATION OVER 39,000

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Oil-in-solvent (miscella) refining by Ranchers ups quality of oil, increases yield, and simplifies processing — G. Cavanagh, Research Director, and E. J. Cecil, General Manager of Ranchers Cotton Oil Co., and Karl Robe, Associate Editor

144 Urge shift to polyunsaturated fats—Who and Why

Three of the "enthusiasts" named in our February issue — Dr. Norman Jolliffe, Dr. Laurance W. Kinsell, and Dr. Ancel Keys — state their position on this controversial subject . . . also an interpretive commentary by Dr. Irvine H. Page

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ONE OF A SERIES OF CHATS ABOUT CONSERVATION AND CONTROL OF HEAT

SARCO TOPICS

PROBLEMS OF PRECISE TEMPERATURES IN WINE PASTEURIZATION

It's a shame that so many people think you throw grapes in a vat, press them, bottle the juice, and just wait a while to create wine. Even those who pride themselves on their knowledge of wines are seldom aware of the artful engineering required. Pasteurizing wine is actually much more delicate and tricky than pasteurizing milk.

Take temperatures. Wine must be pasteurized at 140°F. And spoilage can cause economic havoc. Those are the facts of life in the world of wine. They might not seem too difficult to live with unless you're in the wine or food processing business. Then you probably know how tough things can get when you have a rendezvous with a thermometer.

Take New York's Monarch Wine Company, producers of Manischewitz Wines. Their Problem: how to maintain the 140° temperature in the heat exchangers despite wide variations in the rate of wine flow. These variations, between 5 to 60 gallons per minute, result from slowdowns and recoveries in the bottling process. Problem: entire system must be capable of complete shutdown when necessary. Problem: wine temperatures must be raised to 140° as rapidly as possible, sometimes an immediate jump of 100°.

Attracted perhaps by aspects of the situation that had little to do with pure science, Sarco engineers applied the collective experience of Sarco technology to the solution of this serious problem. The result for Monarch: the *degree of control* the process demanded—achieved through the excellent use of Sarco Temperature-Pressure Regulators, Float Thermostatic Steam Traps, Thermo-Dynamic Steam Traps, and Pipeline Strainers.

Sarco engineers, ever resourceful, divided each of the two large Cherry-Burrell plate-type heat exchanger units into two separate sections with a blank baffle plate, each with a separate Sarco control. Thermal sensing bulbs were installed in wine discharge and throttling controls hooked into steam supply. As demand

fluctuates, one or both regulators function to maintain the 140° temperature. In higher demand, both regulators are operative; as demand drops and flow decreases, only one regulator supplies steam. Pasteur himself would have been elated.

Each of six smaller capacity shell-and-tube heat exchangers required only one regulator, with sensing bulb inserted into the outlet side of the wine filled shell, and the regulator throttling steam supply to the tube section. Thus, by controlling flow of steam to the exchangers on the basis of pressure and temperature, the Sarco regulators were able to maintain the temperature of the wine at precisely 140° regardless of fluctuations in demand or supply rate. Whew! A lot of engineering went into those two sentences.

From here on it's downhill. To secure complete cut off of the steam supply during scheduled shut-downs of the bottling run, solenoid valves were provided to supplement normal modulating action of the controls. To discharge widely varying loads of condensate continuously and remove immediately all air and incondensible gases, Sarco Float Thermostatic Steam Traps were installed on all condensate outlets. On the drips before each control valve a Sarco Thermo-Dynamic Steam Trap was installed to insure delivery of dry steam. Sarco Pipeline Strainers were installed before all steam traps and valves to protect them against damage by any foreign bodies. And thus ends a classic story of the grape.

Still, this story has been condensed far too much, really, and we feel you've been cheated out of the story's more delicious details. You needn't be, however. We've printed the facts in detail for posterity and you in Sarco Case History 185, complete with drawings that practically make it a do-it-yourself kit. If you would like a copy, we will be flattered to receive your request, and dispatch it with dispatch.

WE'RE ALWAYS IN . . . AND THE WELCOME MAT'S OUT

We always take it for granted that if you are going to be in the vicinity of our plant you'll phone or drop us a line so we can invite you to visit us. You'll find that our factory in Bethlehem, Pennsylvania, is on many well-travelled routes, and that our steam laboratory has much to offer in interest and helpfulness.

Forgive us for being immodest, but the lab is the most up-to-date of its kind in the country.

When you visit us, don't allow yourself to get sidetracked by the drill presses and automatic lathes. We're proud of this equipment but you've probably seen metal mutilated before, and it's our steam laboratory that's unique. We promise you a good show, and if you have any problems, bring them along. We'll solve them while you wait.

ANYONE FOR KEY CHAINS?

We seem to have these key chains. Want one? They're much more convenient than a case. A tiny replica of a Sarco Thermo-Dynamic Steam Trap, Type TD-50 is attached, but you can always remove it if you find it too commercial. There must be many things you could use these chains for. Fishing sinkers? Lengthening a light cord, maybe? Anyway, if your Sarco Representative is out, write in.

Pardon our monopolizing the conversation in this series of paid communiques, but we're trying our best to interest you in certain subjects that concern us both—to the point where you'll communicate. 5900

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PLANT: BETHLEHEM, PA.

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FOOD PROCESSING

(Food Processing Preview)

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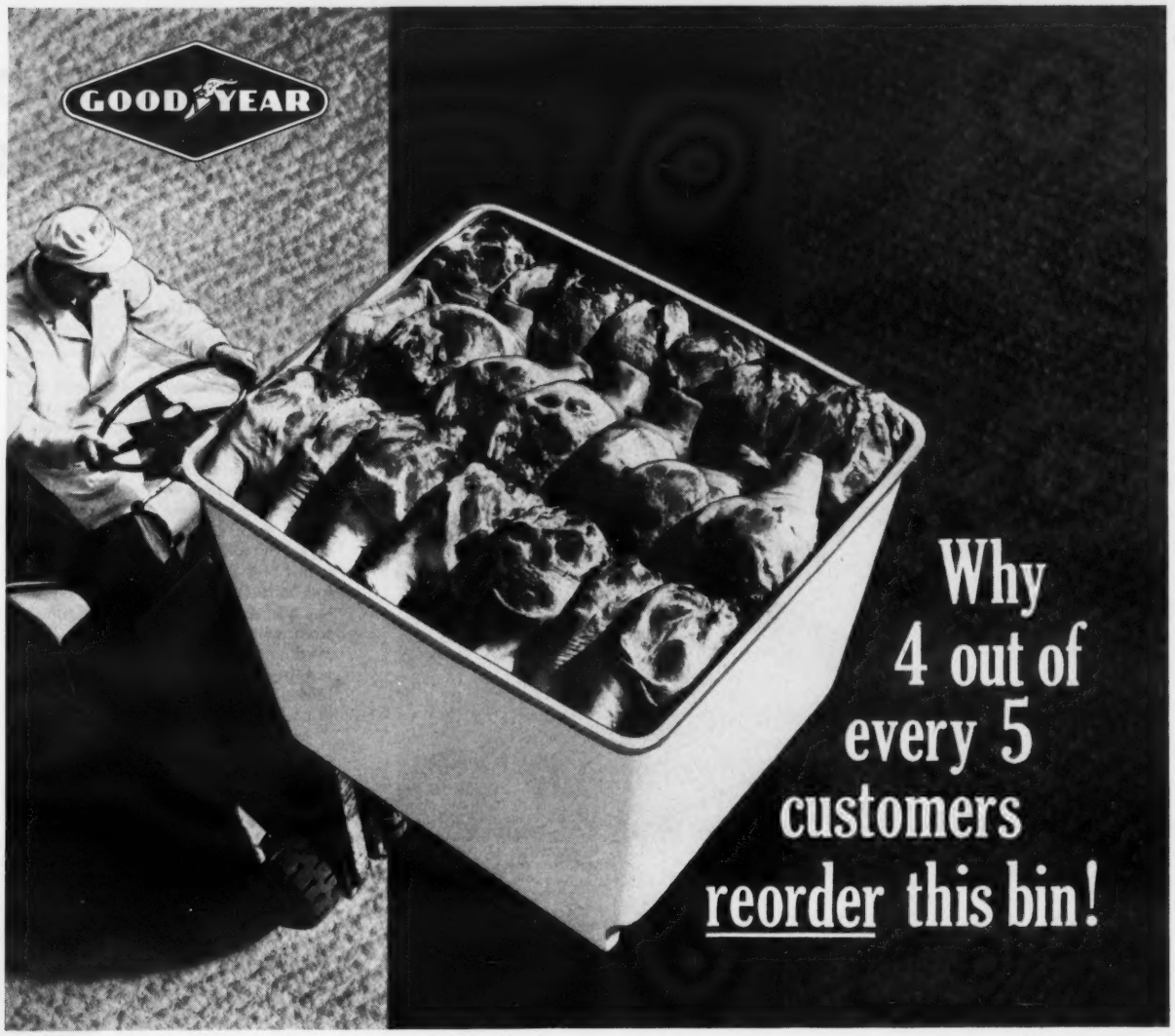

costs ½ as much...weighs ⅓ as much...holds just as much...as approved metal containers

Here's real proof of performance—over 80% of the meat-handling firms that try this new reinforced-plastic bin by Goodyear, place *repeat orders!* Some of them as many as 10 times. Here's why:

It costs 50% less than approved metal containers, yet does a better job any way you measure it.

It weighs two-thirds less than metal containers, yet holds just as much—up to 2600 pounds. Light weight (130 lbs.) cuts handling and transportation costs. Bins "nest" to save storage space, too.

It's far easier to maintain during its long service life. Round inside corners are easy to clean. Rim and corners are ruggedly reinforced to shrug off hard knocks. Won't splinter or corrode.

No wonder the repeat orders are pouring in. Right down the line—from first cost to maintenance—Goodyear's new plastic bin—press-molded on huge matched metal dies—checks out as *your* best buy too. Write for details to Goodyear Aircraft Corporation, Dept. 916UD, Akron 15, Ohio. You'll agree that lots of good things come from Goodyear.

Accessories Available:
1. Lid and Seal Assembly
2. Hold-Down Plate and Clamp
3. Dumping Attachment
4. Dolly Assembly

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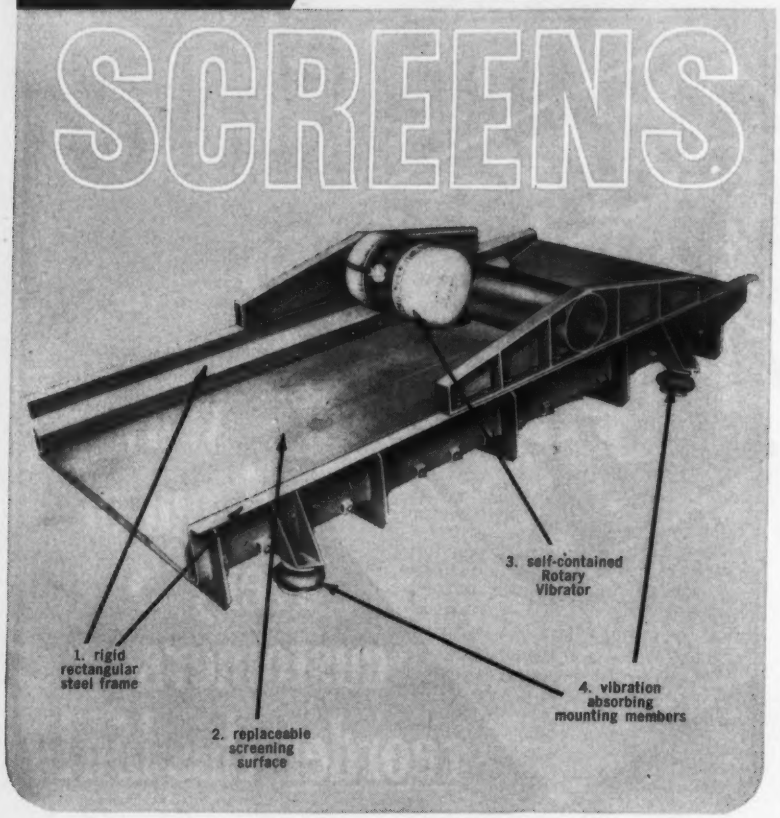
SYNTRON ROTARY VIBRATOR SCREENS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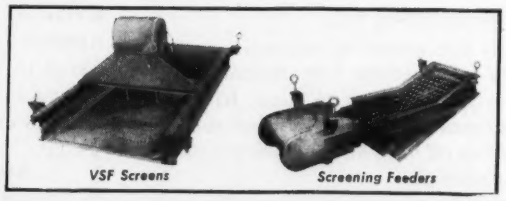

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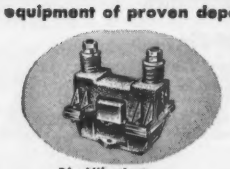
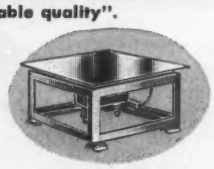


Bin Vibrators



Packer & Jolters

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PRODUCTS AND PACKAGES

Foil-fiberboard can . . .

. . . now in use by H. P. Hood & Sons, Inc., Dunedin, Fla., for marketing of their Southern Sun frozen orange juice concentrate, utilizes laminated aluminum foil in place of the conventional tin-plate steel or sheet aluminum.

All can components — inner layer of foil, body wall of fiberboard and outer protection layer of foil (which doubles as the label) — are spiral wound into a tube, from which the cans are cut. For product freshness, inner laminated foil liner has a specially designed folded lap seam; in addition, liner is coated.

In the six-oz frozen orange juice container, initial savings of about 20 per cent can be effected over conventional six-oz tin-plated steel

cans; about 14 per cent over aluminum cans with tin-plate ends.

Supplier: A development of Anaconda Aluminum Co., can is produced by R. C. Can Co., 9432 Page Blvd., St. Louis 4, Mo.

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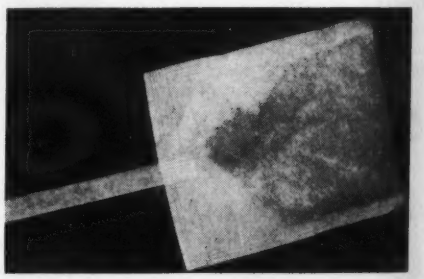

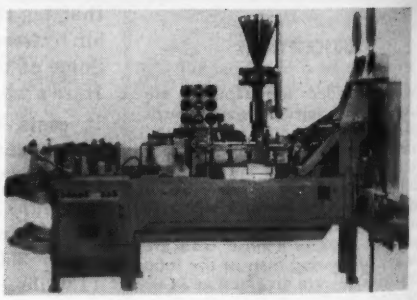

Tape for Tetley . . .

. . . has drastically cut packaging costs over the old string-and-tag style tea bag. Same machinery that forms, fills and seals each pouch (lower photo) also automatically affixes tape and wraps it around pouch. Tape is a feature of Tetley Tea Co., Inc.'s ¼-oz tea package for hotel, restaurant and other institutional use.

Supplier: Packaging unit by Bartelt Engineering Co., Inc., 1900 Harrison Ave., Rockford, Ill.

6302 on Reader Service Slip.

Best yet for wurst . . .

. . . new air-proof, moisture-proof printed package has been introduced by John Morrell & Co. for its eight-oz Morrell Pride Braunschweiger. Double Dow Saran film, formed into tube, provides greater flavor and freshness protection over extended period, since product is cooked after it is packaged, and the film is oxygen-impermeable. Printed package replaces clear film package which carried band label — but band effect is retained in the series of Morrell

Pride emblems printed around the tube.

Suppliers: Film by Teek-Pak, Inc., 3520 S. Morgan, Chicago, Ill.

6303 on Reader Service Slip.

"Chub" sausage-packing machine by Kartridge-Pak, Inc., 9151 W. Fullerton, Franklin Park, Ill.

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Poly-unsaturation is emphasized . . .

. . . on label of Western Chef cottonseed salad oil, distributed throughout the western states by Ranchers Cotton Oil Co., Fresno, Calif. Besides its quality appeal to consumers concerned with a low-cholesterol diet, it has a high smoke point — 470°F — the result of a breakthrough in processing described on p. 38 of this issue.

Quart and pint bottles have no-drip pouring ring, which helps eliminate messy bottles, soiled tablecloths. Half-gal bottle features easy-to-use built-in glass handle.

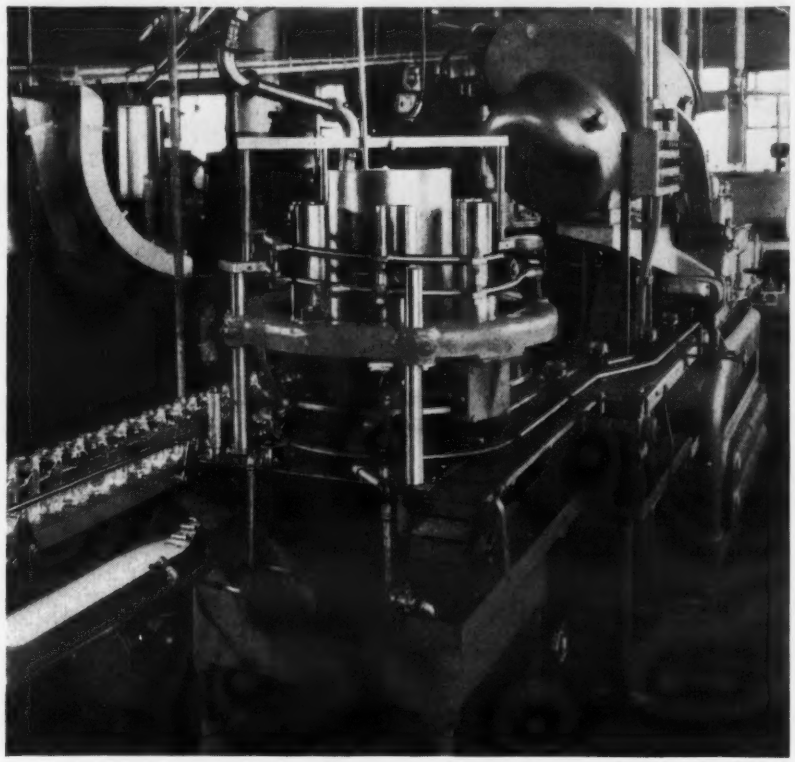
Supplier: Bottles and screw-top closures by San Francisco plant of Owens-Illinois Glass Co., 14th & Adams Sts., Toledo 1, Ohio.

6305 on Reader Service Slip.

Bland bacon . . .

. . . is said to have all the appetite appeal, aroma and taste of regular bacon, but with less than a fourth of the latter's sodium content — 20 mg per slice compared with 96 for regular. Of prime interest to low-salt dieters, "Meat-etic" brand bacon is processed under strict U.S. Government inspection, and comes in six- and 12-oz packages. Product is exclusive with Merkel, Inc., Jamaica, L.I., N.Y., and a patent is pending.

FLUIDICS* AT WORK



How to fill even viscous hot fudge with speed and accuracy

If you have problems filling heavy or viscous products accurately without losing speed, consider the experience of the Robert A. Johnston Company with their six-station Pfaudler® rotary piston filler.

Mr. A. O. Meyer, Plant Manager, says, "The Pfaudler filler has been giving us some very good results. We fill approximately 55 six- or eight-ounce jars per minute with heavy hot fudge without a spill. And we also package caramel, butterscotch and chocolate syrup.

"The filler takes only about a half hour to clean thoroughly. We've had very little maintenance with it. In fact, all it really needs is a routine cleaning and lubrication."

The RP-6 filler is the smallest in the Pfaudler line . . . an ideal model for filling small lots of a number of products. Change-over for various container heights takes only about 12 minutes. Other models of the rotary piston filler will handle up to 1050 cans a minute. All these fillers are rated to ±0.1 fluid ounce accuracy for most products.

If you'd like the full story on the complete line, write to our Pfaudler Division, Dept. FP-41, Rochester 3, New York.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS . . . the science of fluid processes

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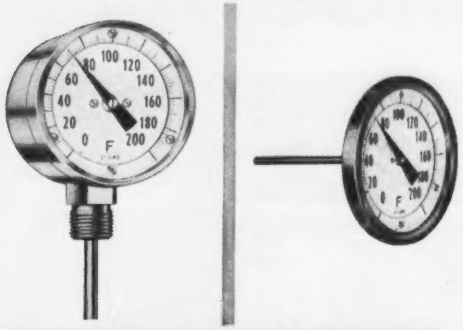
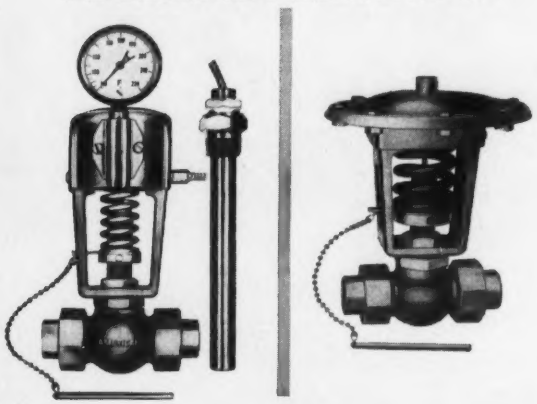


TEMPERATURE AND PRESSURE REGULATION



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conventions and exhibits

Apr. 20-21. National Fruit & Syrup Manufacturers Assn., Inc., 44th annual convention, Savoy-Hilton Hotel, N.Y.

May 1-3. American Oil Chemists' Society, spring meeting, Sheraton-Jefferson Hotel, St. Louis.

May 7-11. Institute of Food Technologists, 21st annual meeting, Hotel Statler-Hilton, New York.

May 9-11. The Material Handling Institute's Eastern States Show, Trade and Convention Center, Philadelphia.

May 24-26. Canadian Institute of Food Technology, fourth annual conference, Queen Elizabeth Hotel, Montreal, Canada.

June 5-9. The Society of the Plastics Industry, Inc., Ninth National Plastics Exposition, Coliseum, and concurrent SPI National Plastics Conference, Hotel Commodore, New York.

June 6-8. Instrument Society of America, ISA Summer Instrument-Automation Conference & Exhibit, Royal York Hotel and Queen Elizabeth Hall, Toronto.

June 12-15. National Confectioners Assn., 78th NCA convention & exposition, Conrad Hilton Hotel, Chicago.

June 13-25. First International U.S. Food Fair, Mid America Fair Grounds, Topeka, Kans.

June 18-23. The Assn. of Food and Drug Officials of the U.S. (AFDOUS), 65th annual conference, Mayflower Hotel, Wash., D.C.

July 24-26. American Oil Chemists' Society, 1961 Short Course on "Newer Lipid Analyses," University of Rochester, Rochester, N.Y.

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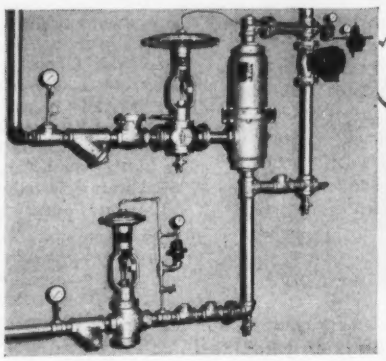

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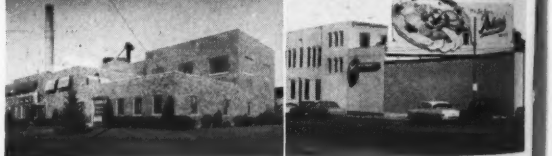

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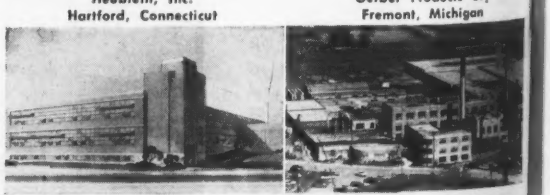

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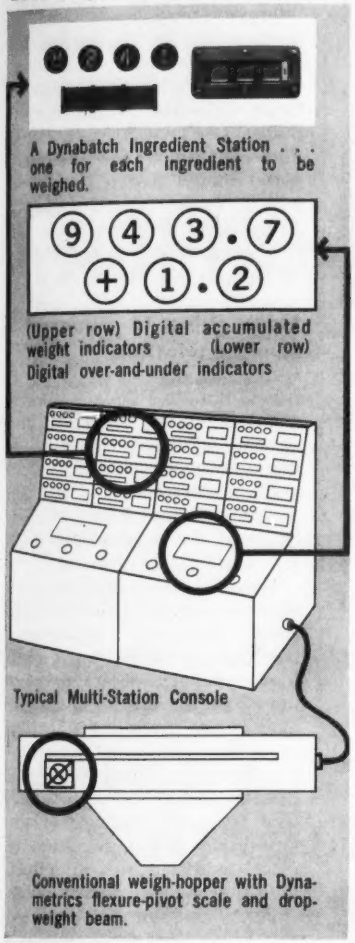
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food regulations

Food additives get automatic extension of 'a couple of months'

Legislation now in process is compromise between FDA's 'open end' extension idea and Rep. Delaney's two-year proposal

UNLESS unexpected opposition arises, the FDA-backed bill to postpone the effective date of the Food Additives Amendment to June 30, 1964, will pass the Senate (it has already passed the House) and be sent to the White House to be signed into law.

Meanwhile, time extensions already granted to March 6, 1961, will automatically be extended "a couple of months," according to FDA Commissioner Larrick. This is the time period FDA is allowing for filing for further extensions under the expected new law, but it also creates a bridge to carry food processors from the March 6 deadline to the effective date of the new law.

Commissioner Larrick said that if the legislation now pending goes through, FDA will advise industry it is prepared to consider requests for further extensions under that legislation. He said he thought that "a couple of months" was a reasonable time allowance to handle such requests.

The new law would grant a 40-month extension to additives for which FDA already has applied the one-year extension to March 6, 1961. It would also apply to about 50 additives for which extension application had been filed but not acted on.

The new legislation as it now stands is a compromise between an "open end" extension of the Food Additives Law effective date asked by Commissioner Larrick and a flat two-year extension asked by Rep. Delaney (D., N.Y.).

Frozen Food Codes

- **In effect in Massachusetts**
- **AFDOUS in June?**

How do law enforcement officials view initial compliance with the Frozen Food Code which went into effect in Massachusetts on Feb. 1.

The director of the Division of Food and Drugs, Department of Public Health, George A. Michael states: "As of this date, retail stores, cold storage warehouses, distributors and processors were operating at about 80 percent average compliance with the code. One of the reasons for this fine ratio of compliance at this time is the exceptional co-operation given to us by the industry in general.

"It seems that everyone located outside of Massachusetts and connected with the frozen food industry has some impression that only turmoil and confusion is developing in conjunction with the adoption of this code. However, just the contrary is the case."

Previously, in discussing the controversial bacteriological standards, he said: "Can you imagine a food processor complaining that the standard could only be met 95 percent of the time, but that in 5 percent of the time it couldn't be met, and therefore they couldn't live up to it? It may well be that there is lack of understanding in methods of law enforcement as it pertains to bacteriological standards."

Industry, which all along has been fighting a delaying action, contends that the code places too much discretionary power in law enforcement officials.

Industry also criticizes state public health officials for setting up a quality code for frozen foods when less stringent regulations would suffice for public health protection.

Most state officials, how-

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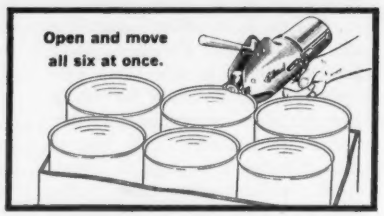

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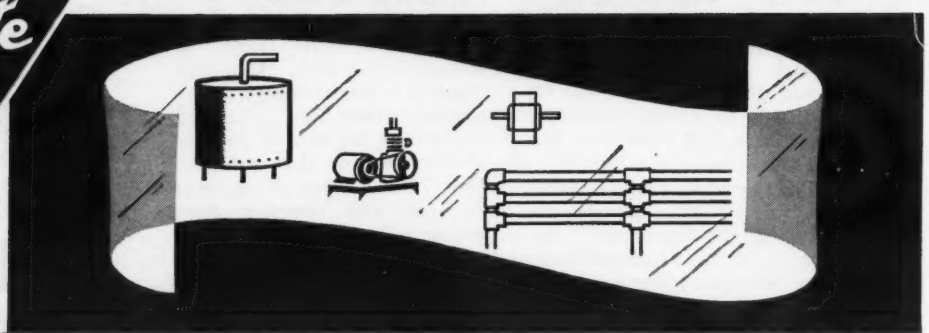

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ever, take the position that frozen foods are premium items and should be handled in a manner guaranteeing maintenance of such quality.

Other states have delayed further action on setting up law enforcement programs until the Assn. of Food and Drug Officials of the United States (AFDOUS) meets this June. At that time the proposed model frozen food code will be reviewed and probably adopted, at least in part, for recommendation to the states.

Many object to proposed color regulations

Reaction to FDA's proposed regulations for enforcing the colors additives amendment has been "extremely heavy and unanticipated," in the words of one FDA official. Some of the proposed sections are highly controversial.

Heaviest response came to sections setting fees for petitions. Industry spokesmen, particularly those for frozen foods packers, object to paying $3000 merely for listing or exemption from certification of color additives generally conceded to be harmless, and coming under the color additive law only because of the extremely broad definition of color additive — in effect, anything which imparts color.

FDA has not yet analyzed the replies. The commissioner's office is just now getting organized to enforce the amendment. However, an official takes exception to the industry's reaction to the fee schedule. "These fees were carefully set after some real study — I assure you, some very real study," he said. He pointed out that FDA's position is this: Congress intended that enforcement of the color additives amendment should be supported fully by the industry through fees.

The agency does not expect the huge pile-up of petitions that was experienced under the food additives amendment. There are not nearly so many color additives to handle, and FDA has the experience of the food additives amendment as a guide to operations.

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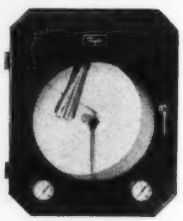

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U.S. Appeals Court rules in FDA's favor in deceptive packaging case

FDA has finally won a round in the Delson Thin Mint case, a test case on the enforceability of deceptive packaging laws.

The U.S. Court of Appeals for the Third District has upset an earlier ruling by the Federal Court for the District of New Jersey in which the lower court said the government failed to prove that the packages in question were, in fact, misleading (see FOOD PROCESSING, August, 1960).

The higher court now declares that the lower court "has not made the necessary findings of fact to support the legal conclusions which it reached" and has remanded the case back to the district court.

The district court can now (1) open the case to new testimony (which FDA legal officers say is unlikely), (2) reviews the record and decide again in Delson's favor, or (3) review the record and decide the case in FDA's favor.

FDA ruling sought for 201 organic dyes for packaging

The Synthetic Organic Chemical Manufacturers Assn. has asked FDA asked to issue a regulation to permit use of 201 synthetic organic dyes proposed for use as colorants in paper and paperboard intended for food wrapping or packaging.

This climaxes a two-year program FDA officials have been watching keenly as an example of FDA-industry cooperation, and intra-industry cooperation, to ease burdens imposed on all parties under the new additives regulations.

SOCMA members and nonmember dye manufacturers around the country have been cooperating with paper and paperboard manufacturers in testing the safety of these dyes when used to color paper and paperboard intended for food packaging. They consulted FDA first to help establish test standards appropriate to the 1958 amendment.

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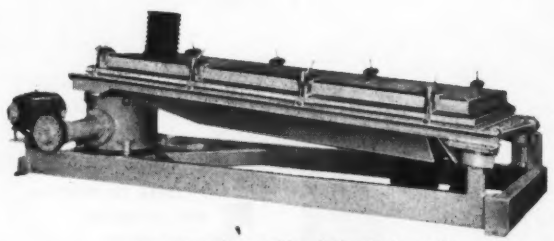

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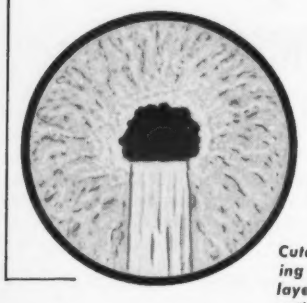

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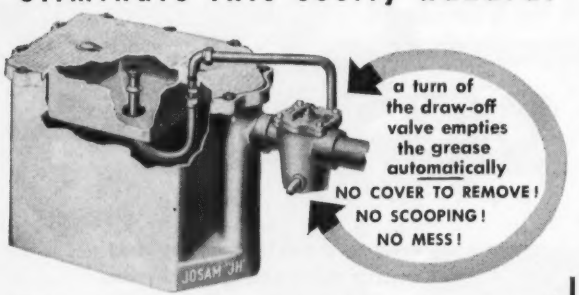

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food regulations

FDA tallies 996 actions in 1960 regulatory work

FDA last year seized 20,825,741 pounds of food in 996 actions. Of that amount, six million pounds were seized on the basis of health hazard, 14,500,000 pounds were filthy or decomposed, and 270,000 pounds represented such economic violations as short weight, misbranding as to name, etc.

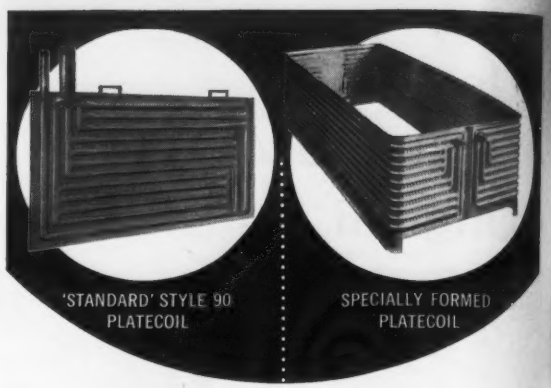
Through FDA's efforts, there were 227 voluntary plant improvements costing a total of $6,799,000. Processors voluntarily destroyed 13,357,000 pounds of foods.

FDA filed 260 criminal cases in 1960, and completed 232, requested 26 injunctions and was granted 14. The agency was involved in 24 trials. It won 19. FDA lost two. Two trials resulted in a hung jury (and in one case the defendant later pleaded guilty). One trial was undecided at year's end.

Dr. K. L. Milstead, director of the Division of Regulatory Management, Bureau of Enforcement, used the occasion of the Atlantic Fisheries Technological Conference in Williamsburg, Va., to describe last year's enforcement record. He presented these enforcement statistics for the fishery industry in 1960:

Establishment inspections	1,614
Total domestic samples examined	499
Import samples examined	1,243
Wharf examinations	969
Seizures	38
Prosecutions	4
Injunctions	1
Import detentions	372
Violation of probation	1

The injunction was against a packer of frozen processed products, frozen breaded shrimp and similar products. The complaint was an insanitary factory. Two of the prosecutions were against packers of fresh crabmeat, charged with having insanitary plants. A packer of frozen precooked products was charged with having an insanitary plant, and an oyster packer was charged with adding water. The proba-



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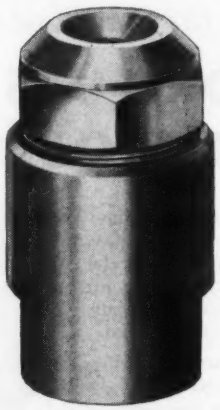

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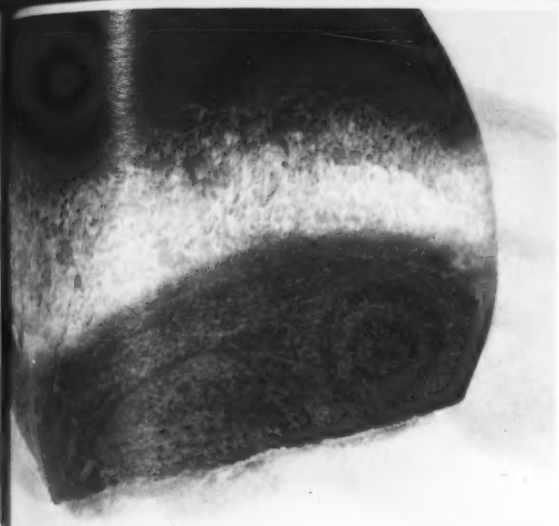
For more information on product at right, circle 6319 opposite last page



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VH60-7

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tion violator was a packer of frozen crabcakes, fish cakes, and stuffed crabs. He had been charged with having an insanitary plant.

The product most often seized for decomposition was ocean perch fillets. Others seized in significant numbers were haddock fillets and halibut parts. There were three seizures of ocean perch fillets for containing parasites, copepods. There were three actions against canned tuna for failing to comply with the standard of fill.

Milstead says there have been no serious enforcement problems so far in the fishery industry under the Food Additives amendment. Many fishery industry additives already have been declared safe, and others have been granted time extensions.

FDA finds it's becoming more and more a rule maker

FDA officials are devoting more and more of their time each year to rule-making and related activities. The Food Additives and Color Additives Amendments are taking from the courts the old system of judicial interpretation of law, and thrusting this job on the FDA.

Says Deputy Commissioner John L. Harvey: "Last year a very large proportion of the time of the top management of the FDA was spent on regulations and problems that arise from the rule-making procedures."

Harvey says that the bulk of FDA's administrative and legal efforts are devoted to the rule-making process. For example, since enactment of the Pesticide Chemicals Amendment in 1954, FDA has established more than 2,000 individual tolerances for considerably over 100 pesticides used on a variety of crops.

However, between 1938 and 1954, FDA established by traditional rule-making procedures only one formal tolerance for a poisonous substance in food. This was the tolerance for fluorine on ap-

HENSZEY

DR Evaporator reduces costs increases profits

■ Fuel Costs — less than a ten-effect evaporator, requires no steam, no water. ■ Easy Installation — no expensive piping. Unit is compact, requires far less installation space. ■ Low Labor Cost — unit is nearly self-operating with push-button cleaning cycle. ■ Higher Product Quality — once-through circulation reduces in-process time. Product temperature is much lower than with modern steam units insuring maximum Whey-Protein Nitrogen values. All stainless steel contact surfaces and built to 3A standards. ■ Versatility — with the DR unit, whey can be condensed to 60% total solids continuously, while skim and whole milk, buttermilk and other products are processed just as easily and economically in a wide range of densities. ■ Literature and further information available.

HENSZEY COMPANY INC.
Dept. FP Watertown, Wisconsin

6321 on Reader Service Slip.

ples and pears. The courts later ruled this invalid.

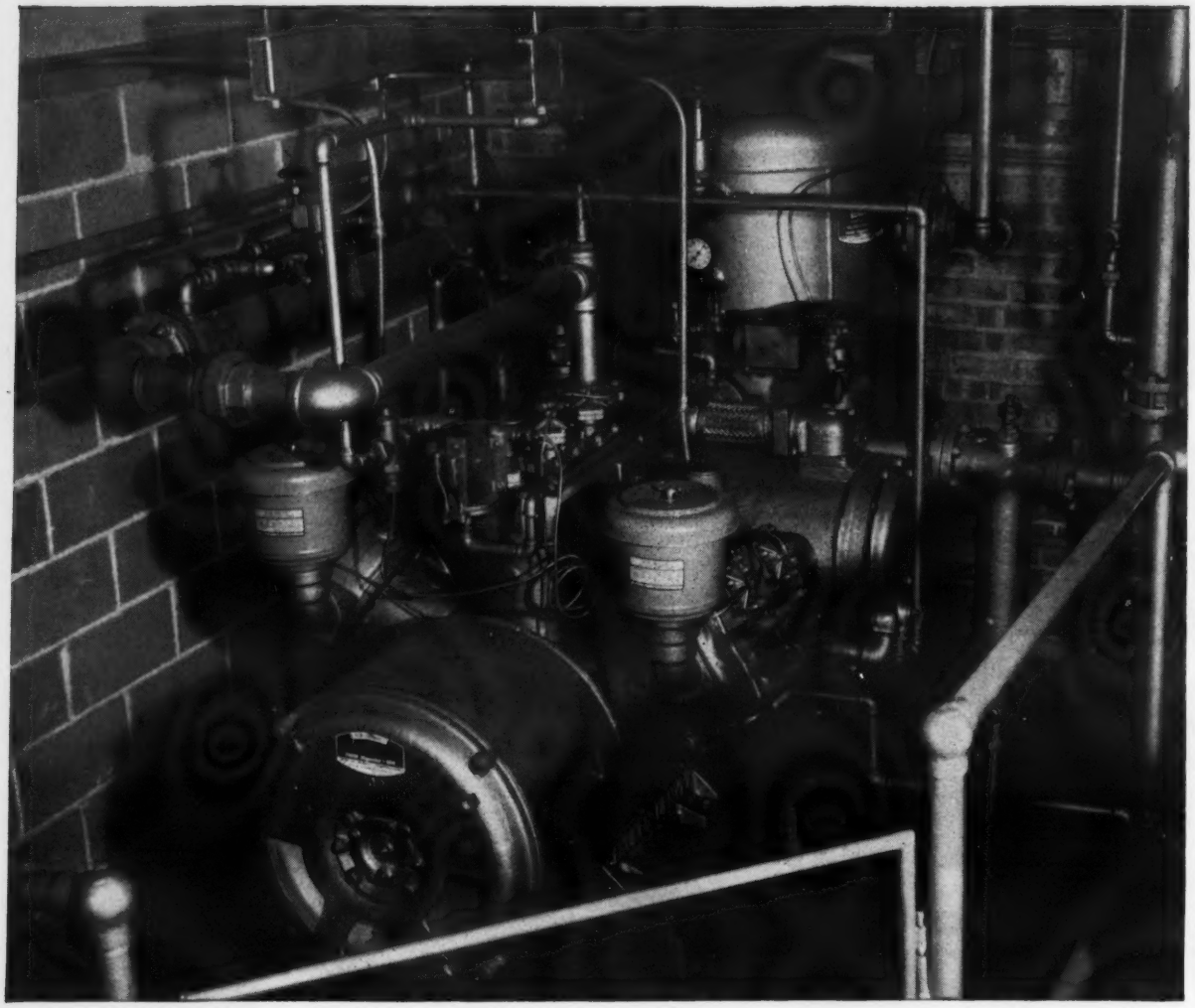
The need for rule-making is now snowballing. Referring to the great increase of rule-making time called for after passage of the Pesticide Amendment, Harvey says: "It is quite apparent that there will be a similar flow of regulations for food additives." So far as rulemaking is concerned, he says that the Food Additives and Color Additives Amendments "present a serious challenge."

Food, color additives guide published

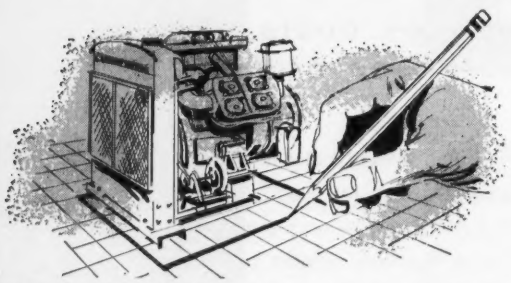
Five-volume directory service to maintain up-to-date record

An estimated 7000 *Federal Register* references, plus pertinent information on official actions concerning thousands of food and color additives, has been published in a new five-volume "Food and Color Additives Directory."

The directory has been jointly produced by Information for Industry, Inc., 1000 Connecticut Ave., N. W., Washington 6, D.C., and Hazle-



Space-Saving Cost-Cutter—Gardner-Denver WB



SAVING YOUR FLOOR-SPACE DOLLARS—that's one more example of Gardner-Denver Engineering Foresight. Our engineers know your problems . . . design equipment to fit your needs. At Gardner-Denver there's no substitute for men—our philosophy as we enter our second century of service.

Here's everything you could want in an air compressor. And look how compact this space-saver is. Quickly spot it in a corner, hook it up, and it runs for years without the touch of a wrench.

The picture above is typical of a complete Gardner-Denver WB compressor package. Includes clean air aftercooler complete with moisture separator, air receiver and automatic controls.

Save floor-space dollars and get a lasting supply of compressed air with a Gardner-Denver WB. Choose from seven sizes—142 to 1150 cfm piston displacement. Each size is a packaged unit that's easily and quickly installed without costly foundation work. Write for Bulletin WB-10 or consult your Gardner-Denver compressor specialist.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois — Offices in principal U.S., Canadian and Mexican cities. In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario. International: Gardner-Denver International Division, 233 Broadway, New York 7, N.Y.

International Offices: Buenos Aires, Argentina; Artarmon, N.S.W. Australia; Brussels, Belgium; Rio de Janeiro, Brazil; Santiago, Chile; Barranquilla, Colombia; Lima, Peru; Ndola, N. Rhodesia; Salisbury, S. Rhodesia; Johannesburg, Transvaal

6322 on Reader Service Slip.

To the Engineer or Technologist who can write . . . .

FOOD PROCESSING has an opening on its editorial staff for a technically trained man. Preference will be given to a chemical engineer familiar with food processing or a food technologist with processing experience. Job will involve travel in development of article material. Will consider eventually setting up editorial office in the East.

Send resume to

H. P. Milleville, Editor,

FOOD PROCESSING

111 East Delaware Place,

Chicago 11, Illinois.

ton Laboratories, P.O. Box 30, Falls Church, Va.

The directory's loose-leaf style of publication will make it easy for subscribers to this service to substitute revised pages each month to keep the directory up-to-date.

Each substance in the directory will be referenced alphabetically, and action relating to it will be listed on a separate page. Where there has been action concerning a substance during the preceding month, the entire page covering it will be reprinted to include all the latest information.

Subscription prices are $150 for each initial directory set of five volumes, and $150 a year for the monthly revision service. The initial five volumes will contain approximately 4000 pages of references covering actions on food and color additives occurring between September 1958 and Jan. 31, 1961.

6323 on Reader Service Slip.

Reviews current FDA regulations

Current regulations of FDA and how they affect sanitary requirements in food processing plants are reviewed in a new eight-page pamplet by the Food and Drug Surveys Division of Arwell, Inc., 757 North Broadway, Milwaukee, Wis., a plant sanitation organization.

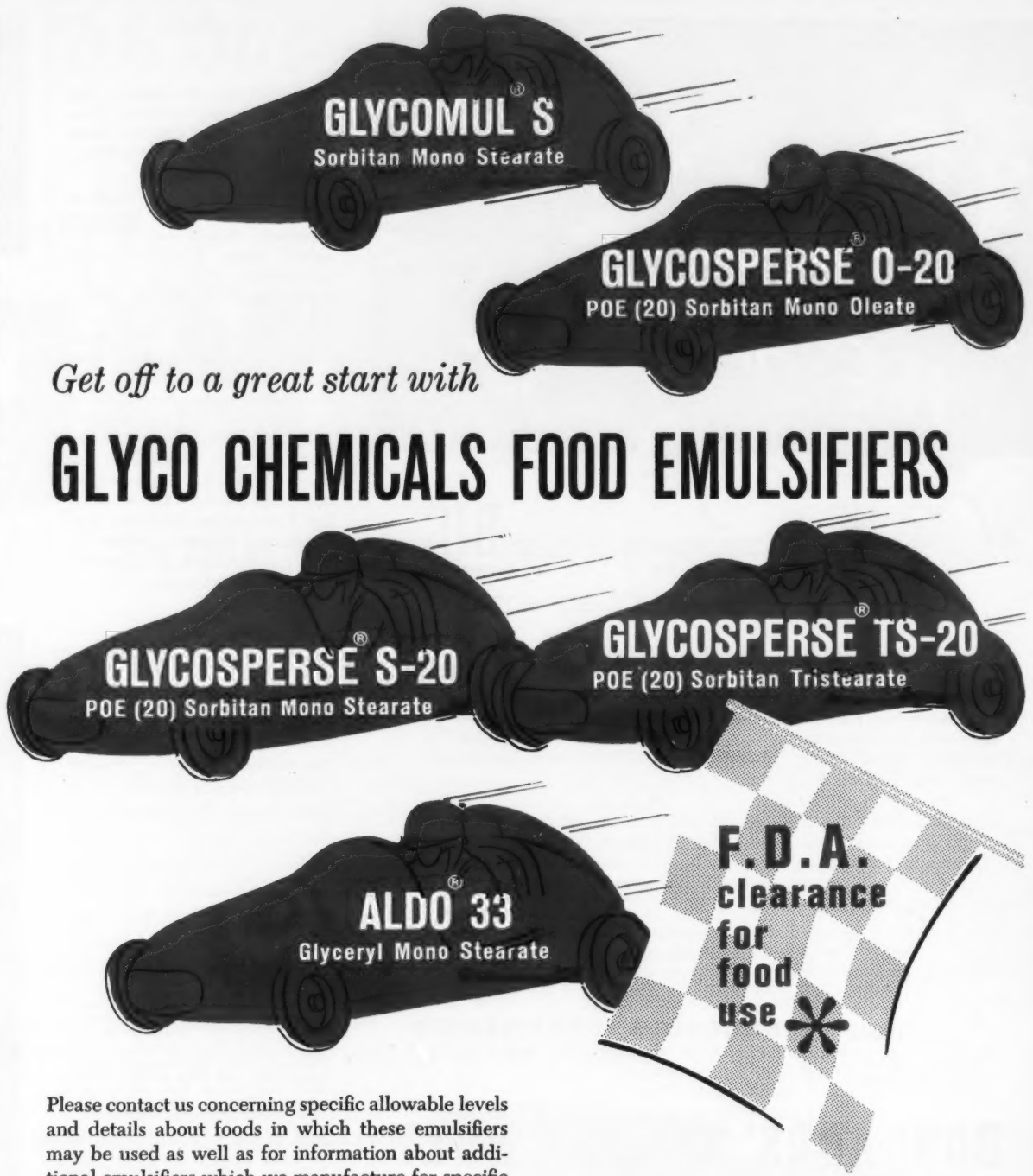
Included in the review are suggestions on what FDA inspectors look for in food processing facilities and what to do, and not do, when these inspectors visit a plant.

6324 on Reader Service Slip.

'Standards for Farm Products' published by USDA

All U.S. Department of Agriculture standards in effect at the beginning of 1961 are listed in "Checklist of U.S. Standards for Farm Products."

These are quality standards. Although nearly all are voluntary, they are used extensively, often for convenience in identification in marketing



Please contact us concerning specific allowable levels and details about foods in which these emulsifiers may be used as well as for information about additional emulsifiers which we manufacture for specific food applications.

If you will be at the IFT Meeting in New York May 7th through 11th, please visit us at Booth No. 6. We will be happy to speak with you and answer your inquiries. See you there.

* Sorbitan Mono Stearate
Polyoxyethylene (20) Sorbitan Mono Stearate
Polyoxyethylene (20) Sorbitan Mono Oleate
Polyoxyethylene (20) Sorbitan Tristearate
Glyceryl Mono Stearate

GLYCO CHEMICALS
Div. of Chas. L. Huisking & Co. Inc.
417 Fifth Avenue, New York 16, New York

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makes the BIG difference

BONGARDS' POWDERED WHEY AND BON-O-LAC (Baker's Blend) . . . is made only from the whey from our own natural cheese in our own plant. Immediately after the whey is separated from the curd, it is pumped through stainless steel pipes to the most modern whey processing equipment in the country where it is condensed and powdered by an exclusive spray process, then sealed fresh in special bags. This FRESHNESS eliminates off odors and non-whey flavors that are encouraged by the normal delays of holding and hauling.

BONGARDS' POWDERED WHEY can help you offer better products at lower cost — whether you produce BAKERY GOODS, CANDIES, ICE CREAM, SHERBETS, PREPARED MIXES, SAUSAGES, MEAT PRODUCTS, CREAMED FOODS . . . or hundreds of other products where a better, lower cost dairy ingredient will support and accent the natural desired flavor of your product.

You'll appreciate the instant moisture absorption and perfect dispersion in your ingredient blending — the particle size can be varied to suit your needs. Being non-hygroscopic, Bongards' Powdered Whey will never cake or harden.

✓ Send for working samples
✓ Bakers ask for BON-O-LAC blend

BONGARDS' CREAMERIES
Dept. P • BONGARDS, MINNESOTA

BONGARDS' *Powdered* WHEY

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food regulations

farm products. Processors use them in quality control programs, and they are the basis of Federal, and Federal-State, grading services.

The booklet is cataloged as "AMS 210." Copies of the standards listed can be obtained from USDA's seven commodity divisions in the Agricultural Marketing Service.

A detailed list of grade names for all agricultural commodities for which U.S. standards have been issued is available in Agricultural Handbook 157, "Grade Names Used in U.S. Standards for Farm Products." Single copies are available from the Marketing Information Division, Agricultural Marketing Service, U.S. Department of Agriculture, Washington 25, D.C.

NEW ADDITIVE PETITIONS

Oxidized and epchlorochydrinized starch: for use in sizing and coatings of paper and paperboard for food packaging. (A. E. Stanley Manufacturing Co., Decatur, Ill.).

Neoprenelatex cap-sealing compound: For use in food jar caps. (W. R. Grace and Co., Cambridge 40, Mass.).

Distilled acetylated monoglycerides: For use in vitamin capsules. (Distillation Products Industries, Rochester 3, N.Y.).

Butylated hydroxyanisole: For use as a concentration of 0.1 percent in active dry yeast. (Red Star Yeast and Products Co., Milwaukee 8, Wis.).

Furcellaria: For use as an extract of Furcellaria fastigiata in foods. (Uni-Gum Div., T. M. Duche and Sons, Inc., Clifton, N.J.).

Sources of Radiation: For the use of certain radiation sources for the inspection of foods and food packages and for controlling food processes. (General Electric Co., Milwaukee, Wis. and Industrial Nucleonics Corp., Columbus 2, Ohio).

Polyamide resins, sulfonamide, formaldehyde resins, and ethyl toluene sulfonamide: For use in food packaging of sideseam cements. (Dewey and Almy, Ltd., London NW. 10, England).

Rosin: For use in rosin sizing produced from gum rosin, wood rosin, tall oil rosin, partially hydrogenated rosin, fully hydrogenated rosin, or dark wood rosin in the manufacture of paper and paperboard for food packaging. (Hercules Powder Co., Inc., Wilmington 99, Del.).

Polybutoxy polypropoxy polyethyoxyglycol, polypropoxy poly-oxyethylene glycol, and nonyl phenol: For use in the processing of paper for food packaging. (Economics Laboratory, Inc., St. Paul 1, Minn.).

Natural latex cap-sealing compounds: For use in food-packaging applications. (W. R. Grace and Co., Cambridge 40, Mass.).

Procaine, Penicillin, novobiocin, neomycin, dihydrostreptomycin, prednisolone, and chlorobutanol, suspended in 2 percent peanut oil with aluminum monostearate: Intended for intramammary, intrauterine, otic, and dermal use in animals. (Upjohn Co., Kalamazoo, Mich.).

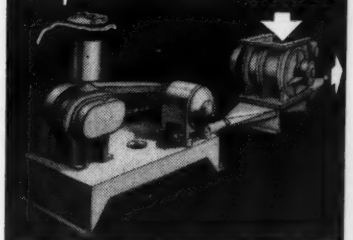
Maleic hydrazide: for proposing the es-

continued on page 22

SPROUT-WALDRON PUTS DATA PROCESSING TO WORK TO SAVE YOU MONEY ON
PNEUMATIC CONVEYING SYSTEMS

75% to 80% of all pneumatic conveying needs are now standardized systems. Component parts are manufactured in quantity and shipped from stock — *with the savings passed on to you!*

4
STANDARDIZED
EASY-TO-ORDER
PACKAGED AIR SYSTEMS
stocked for immediate shipment at BIG SAVINGS



Write for Bulletin 228 showing standardized components, capacities, horsepower requirements — complete information on how to order without delay or outside assistance. 627

SW **SPROUT-WALDRON**
Muncy, Pennsylvania
SINCE 1866
Size Reduction • Size Classification • Mixing & Blending
Bulk Materials Handling • Pelleting & Densifying

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In the busy months ahead...

INSIST ON

genetron®

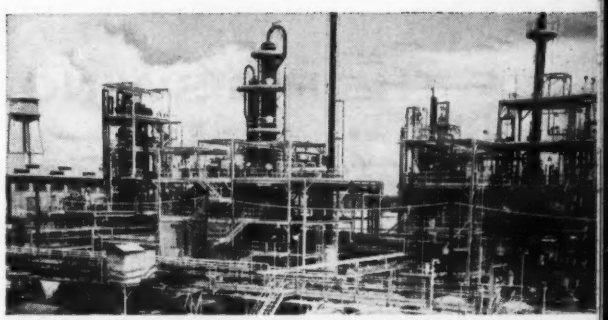
SUPER-DRY REFRIGERANTS

...and be sure of the best!

General Chemical's advanced manufacturing techniques have helped bring new quality standards . . . new highs of purity and dryness for refrigerants. "Genetron" refrigerants are approved . . . accepted . . . and *preferred* as original charge and replacement in all types of modern refrigeration equipment.

See your wholesaler before the rush starts . . . make sure you're covered for all your refrigerant needs in the hurry months ahead. Be sure, also, to see the new "Genetron" Kit for field testing hermetic burnouts and the new pressurized "Genetron" 11 solvent cylinders for cleaning out mildly contaminated jobs; your "Genetron" wholesaler can tell you about this new "Genetron" service while you are there.

genetron 11 CCl_3F ORANGE LABEL TRICHLOROMONOFLUOROMETHANE
genetron 12 CCl_2F_2 WHITE LABEL DICHLORODIFLUOROMETHANE
genetron 22 $CHClF_2$ GREEN LABEL MONOCHLORODIFLUOROMETHANE
genetron 113 $C_2Cl_3F_3$ PURPLE LABEL TRICHLOROTRIFLUOROETHANE
genetron 114 $C_2Cl_2F_4$ BLUE LABEL DICHLOROTETRAFLUOROETHANE



"GENETRON" PRODUCTION CENTER

"Genetron" Super-Dry Refrigerants are produced in this giant fluorochemical center in Baton Rouge, La. . . . in Danville, Illinois . . . and will also soon be produced on the East Coast at a new plant now under construction at Elizabeth, N.J.

NEW! "GENETRON" 11 PRESSURIZED SOLVENT CYLINDER

Special pressurized cylinders of "Genetron" 11 solvent provide an ideal means for cleaning out mildly contaminated systems after burnout.

Allied Chemical

GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N.Y.
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THE BIG SWING IS TO "BIG SAM"

It started with citrus processing...then prune and grape juice...wines...soluble coffee and tea...sugar solutions... protein extracts...now the Big Swing to "Big Sam" is reaching into every branch of the food industry. If old-fashioned, space- and time-consuming batch methods have put a damper on profits, it will pay you to check centrifugal processing with WESTFALIA's "Big Sam"— for fully automatic, around-the-clock, high capacity operation... "Big Sam" means Big Profits.

CENTRICO, INC., Englewood, N. J. FP

My processing problem is:_____

Name_____ Title_____

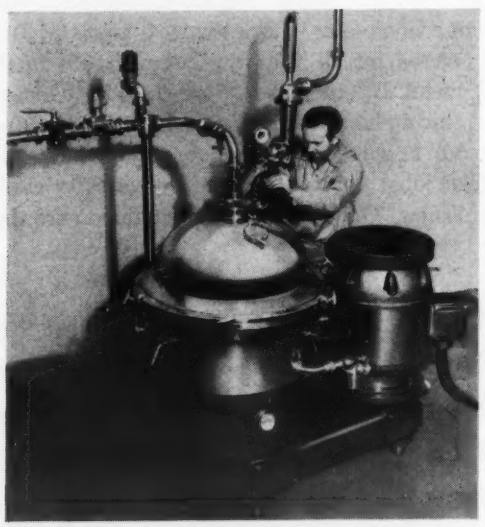
Company_____

Address_____

City_____ Zone_____ State_____

WESTFALIA SEPARATOR | CENTRICO INCORPORATED

75 WEST FOREST AVENUE, ENGLEWOOD, N. J. • Phone LOWELL 9-0755
WESTERN DIV.: 3315 CAXTON COURT, SAN MATEO, CALIF. • FIRESIDE 5-7065



Used to control pulp solids concentration in orange juice, "Big Sam" Automatic De-Sludger in all-sanitary design (Model SAMN-15037) has found wide acceptance in Florida citrus industry. Similar installation is part of unique orange juice processing system developed by Minute Maid Company now in operation at Minute Maid's Plymouth and Leesburg, Fla. plants.

See us at the Institute of Food Technologists annual meeting, Hotel Statler Hilton, New York, May 7-10.

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food regulations

continued from page 20

tablishment of tolerances for residues of maleic hydrazide in or on cranberries at 20 parts per million and in or on peaches at 15 parts per million. (U. S. Rubber Co., c/o Arthur, Dry, and Dole, New York, N.Y.).

Polyethylene glycol 6000: For use as an ingredient of tablets for food use. (Mead Johnson & Co., Evansville 21, Ind.).

Paraffin, polyethylene glycol 400 (30 percent dioleate), methyl oleate, stearic acid, and alcohol as components of defoamer formulations: For use in the manufacture of paper and paperboard for food packaging. (Harry Miller Corp., Philadelphia 40, Pa.).

Styrenemethacrylic acid copolymer: For use as an ingredient of coatings, and adhesives for paper and paperboard used in the packaging, processing, and holding of food.

Tylosin tartrate: For use in drinking water for chickens as an aid in the treatment of chronic respiratory disease in boilers and replacement flocks, or for the prevention of chronic respiratory disease at the time of vaccination or other stress. (Elanco Products Co., Div. of Eli Lilly & Co., Indianapolis 6, Ind.).

Erythromycin thiocyanate in combination with zoalene: For use in chicken feed. (Dow Chemical Co., Midland, Mich.).

Alkyl ketene dimers in paper and paperboard: For food packaging. (Hercules Powder Co., Inc., Wilmington, Del.).

Oleandomycin in combination with zoalene: For use in chicken feed (Dow Chemical Co., Midland, Mich.).

Polysorbate 80 in films: For use in food packaging. (Goodyear Tire & Rubber Co., Akron 16, Ohio).

Dipropylene glycol: For use as an auxiliary lubricant in the rolling of aluminum sheet and foil for food packaging. (Allegheny Refining Co., Verona, Pa.).

Amprolium, with or without penicillin and streptomycin: For use in medicated turkey feed. (Merck and Co., Inc., Rahway, N.J.).

Dipropylene glycol dibenzoate: For use as a plasticizer with vinyl resins in the formulations of adhesives for food packaging. (Tennessee Products and Chemical Corp., Nashville, Tenn.).

Isopropyl alcohol in lemon oil: To establish a tolerance of 10.0 parts per million. (Ventura Processors, Ventura, Calif.).

Epoxy polyamide coating resins; For use in lining tanks containing corn sirup, and in lining crystallization tanks for corn-sirup-sugar solutions. (Cook Paint and Varnish Co., Kansas City, Mo.).

Nystatin in medicated chicken feed: For prevention at a level of 50 grams per ton and for treatment at a level of 100 grams per ton of crop mycosis and/or mycotic diarrhea in chickens and laying hens. (E. R. Squibb and Sons, New Brunswick, N.J.).

Dihydrostreptomycin, nemycin, and polymyxin B: For use in the treatment of mastitis in milk-producing dairy cows. (Anchor Serum Co., St. Joseph, Mo.).

Dibutyl phthalate, dicyclohexyl phthalate, and toluenesulfonamide formaldehyde resin in nitrocellulose lacquers: For use on cellulosic substrates to produce heat-sealing packaging materials for various types of solid foods. (E. I. du Pont de Nemours and Co., Wilmington, Del.).

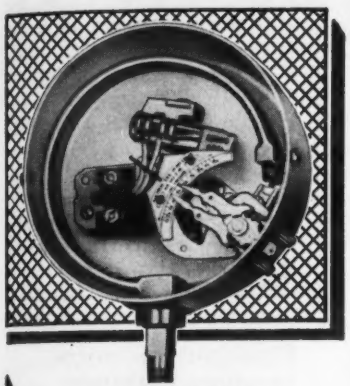
Mineral oil as a component of lubricants: For use in the drawing and forming of sanitary can components for food packaging. (Harry Miller Corp., Philadelphia, Pa.).

Combination of bithionol and methiotriazamine as a coccidiostat: For use in chicken feeds. (Sterling Drug, Inc., New York, N.Y.).

Methylhydrogen polysiloxane, polyvinyl alcohol, isooctylphenol polyethoyoxyethanol, zinc oleate, tin octoate, and formaldehyde: For use in coatings for food packaging materials. (Silicone Products Dept., General Electric Co., Waterford, N.Y.)

316 STAINLESS STEEL

Welded Bourdon Tube and Pressure Connection



A NEW ADDITION to MERCOID PRESSURE CONTROLS

Series D-41, 243, 541

316 stainless steel welded Bourdon tube. ¼" (316) stainless steel pressure connection. Nickel plated mechanism. Outside adjustments. Calibrated dial. Hermetically sealed mercury contact.

Operating ranges: 30" vac.-75 psig; 10-100 psig; 30-400 psig; 75-800 psig. and 100-1000 psig.— with varying differentials and electrical capacity to meet your application.

Three case styles: General Purpose NEMA 1; Weather-Proof NEMA 1A, 2, 3, 4; Explosion-Proof Class 1 Group C, & D; Class 2 Group E, F, G, NEMA 7, 9, 9A.

WRITE FOR BULLETIN 019

THE MERCOID CORPORATION
4211 Belmont Ave., Chicago 41, Ill.

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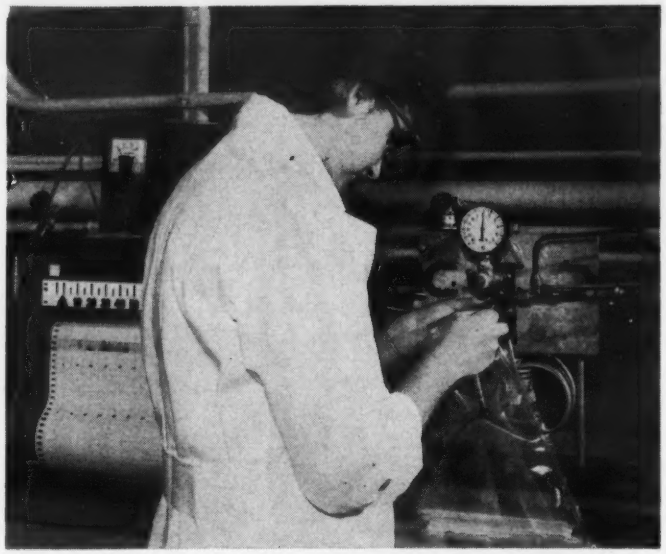


A bag blown up by the subject is analyzed for breath hydrogen on modified chromatograph

Stanford scientists with 'intestinal fortitude' . . .

Draw analytical bead on 'burpie' foods

De-gassing beans first commercial application of new lab measuring technique

FOR CENTURIES, mankind has experienced discomfort — ranging from mild "heartburn" to acute distress — on eating specific amounts of particular foods and mixtures of foods. Each person has his own individual list of such culinary taboos.

Basic reason for discomfort is that when a person eats a food he can digest only partially, it is attacked by organisms when it reaches the lower part of the small intestine.

The bacterial flora form hydrogen gas as by-product in the process of digesting the remaining material. Resulting discomfort depends on amount of the gas — which, in turn, depends on constitution of the flora and amount of undigested food.

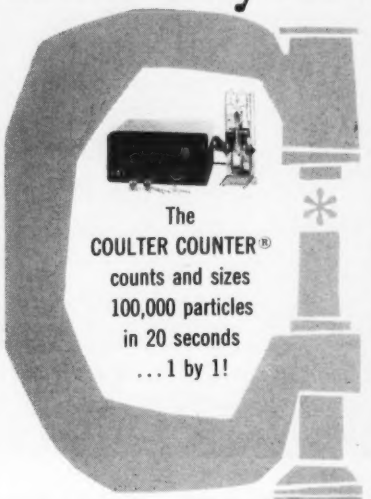
Recently, researchers in Stanford Research Institute's food research group and analytical chemistry laboratories turned modern scientific techniques on the ancient problem — with the encouragement of the USDA and the Idaho Bean Commission, each of whom sponsored various aspects of the research.

A measure of indigestion. The project team reasoned that if gas pressure is present, the hydrogen should pass through the semi-permeable intestinal wall into the bloodstream.

Because hydrogen is inert, and therefore unchanged by body chemistry, the gas should pass eventually to the lungs, and be expelled in the breath.

They modified a gas chromatograph so that, if a bag is

Breakthrough in fine particle analysis!



* *reproducible*
* *1500 installations*
* *range: .5 microns to 250 microns*
* *from catsup to ores; polymers to contaminants . . . whatever the material!*

Patented in U.S.A., Great Britain, France, Germany, Japan, Brazil and throughout the world.

Trade Mark

USE THIS COUPON

COULTER ELECTRONICS, INC.
2525 North Sheffield Ave.
Chicago 14, Illinois

☐ Please send complete details about the Coulter Counter.

☐ Have your representative get in touch for a demonstration in our office.

Name .....

Firm .....

Address ..... Phone .....

City ..... Zone ..... State .....

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THE PURECO CO_2 COLD BLUE LINE prevents product damage from "heat shock"

SAVE WITH PURECO CO_2 "BLAST CHILLING"

Pureco Carbon Dioxide liquid sprayed into trucks or railroad cars reduces interior temperatures to sub-zero in seconds. The warm moisture-laden air is flushed out and replaced with cold, dry vapor, thus preventing "heat shock" from loading temperatures. Time-consuming pre-cooling periods are shortened—after loading pull-down periods are eliminated—product temperatures remain constant.

Pureco CO_2 *Blast Chilling* needs no special equipment . . . it acts as an auxiliary to your truck's normal refrigeration system . . . mechanical units, hold-over systems or "DRY-ICE". Result . . . savings in fuel, maintenance and product.

Pureco "DRY-ICE" holds zero temperatures.

Pureco "DRY-ICE" is the coldest (—109°F) solid refrigerant commercially available. It is simple to use, easy to handle, does not melt but passes directly to a gas. The degree of cooling of "DRY-ICE" can be thermostatically controlled by blowers or other simple means.

Have a trial Blast Chilling demonstration.

Pureco would like to demonstrate the specific uses of Pureco CO_2 *Blast Chilling* and "DRY-ICE" to you in your plant under your working conditions . . . with no obligation on your part. Call your local Pureco representative for details or write:

See us at Booth Nos. 59-60-61 at the N.I.M.P.A. Show

PURECO CO_2

PURE CARBONIC

Pure Carbonic Company, A Division of Air Reduction Company, Incorporated
Nation-Wide Pureco CO_2 Service-Distributing Stations in Principal Cities
General Offices: 150 East 42nd Street, New York 17, N.Y.

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blown up by the subject, the hydrogen in the breath can be measured. By making the test after feedings of separate foods, it is possible to determine what foods and how much are causing indigestion.

First commercial application has been with beans — whose well-known turbulence characteristics now are known to be the result of production of hydrogen and methane (also detectable by chromatograph).

A chemical and leeching process was developed by the food research group to make beans more universally digestible, and greatly reduce gas formation — while not altering their taste. END

association news

Standout technical sessions highlight 1961 IFT

Among the symposia and technical sessions at the 21st annual meeting of the Institute of Food Technologists — to be held at the Statler-Hilton in New York, May 7-11 — several may be of special interest to FOOD PROCESSING's readers. Among these:

Monday morning, May 8. Symposium on Role of Food Technology in Civil Defense will consider: Biological warfare hazards in processed foods; radiological warfare hazards in processed foods; maintaining food safety.

Monday afternoon. Technical Session on Dehydration. Key papers: Optimum processing conditions for freeze-drying; factors influencing the quality of freeze-dried foods; new continuous production facility for processing "instant" precooked beans.

Tuesday afternoon. Symposium on Food Additives. Important papers: The impact of the Food Additives Amendment on analytical laboratory operations; food colors and the new Color Additives Amendment; Food Additives Amendment — impact on the food processor; current aspects of the Food Additives Amendment; recent progress in the

association news

consideration of flavoring ingredients under the Food Additives Amendment.

Tuesday afternoon. Technical Session on Pressurized Food Products. Among other subjects: Food aerosols with Freon C-318 and Nitrous Oxide; aerosol food products in the FP containers; the formulation of self-agitating pressurized food products; aerosol valves for pressurized foods.

Wednesday morning. Symposium on Statistical Quality Control papers will include: An operations research study of a quality control problem in the meat industry; procedures for study of raw product quality attributes, and programming the complex analysis on a computer; application of results of a raw product sampling program to cannery operations for improved processed product quality.

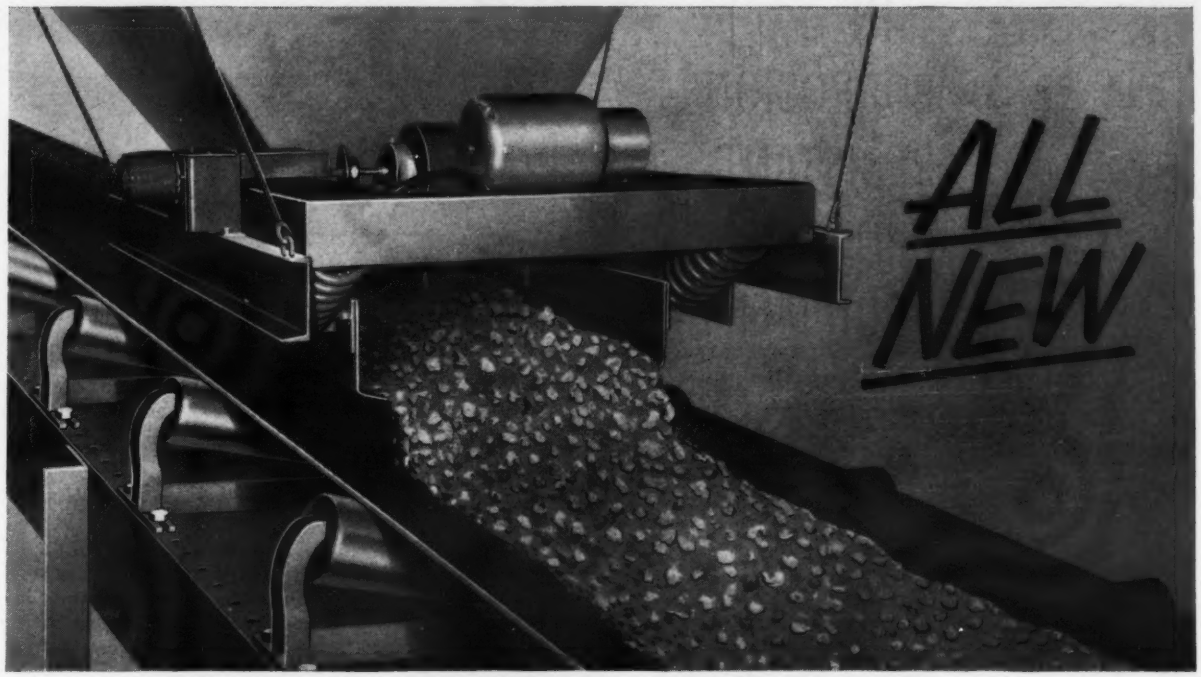
IFT headquarters address is 176 W. Adams, Chicago 3, Ill.

For his research that led to improvements in the nation's tomatoes, **Dr. M. E. Gallegly,** left, professor and plant pathologist at West Virginia Uni-

versity, received the **Joint AAAS-Campbell Soup Company** medallion and $1500 cash award from Dr. Francis C. Stark, right, professor of vegetable crops at University of Maryland. Dr. Chauncey D. Leake, second from left, president of AAAS, and professor of pharmacology at The Ohio State University, and Dr. S. G. Younkin, director of agricultural research for Campbell, observed the presentation.

More Association News appears on page 99.

STEPHENS-ADAMSON



Revolutionary "SOLID STROKE" variable rate Vibrating Feeder!

- **POSITIVE STROKE** — The only vibrating feeder offering a solid drive connection to insure full amplitude of any stroke setting. No dampening under varying headloads.
- **AUTOMATIC STROKE CONTROL** — Offers variable conveying speed from 0 to 90 F.P.M. Easily increase or decrease tonnage handled.
- **EFFICIENT POWER FACTOR** — Standard AC electric motors, operating at peak efficiencies result in high power factor and reduced operating costs.
- **VARIABLE FEED RANGE** — The revolutionary new variable eccentric drive provides variable rate feed, first of its kind ever offered. Manual or electrical remote controls available.
- **ANGLE OF FEED** — Breaking the barrier of solid drives and variable eccentrics, the high amplitude stroke now allows for feeding in a wide range of slopes, even up hill.
- **NATURAL FREQUENCY** — The only vibrating feeder taking full advantage of the well known principle of natural frequency over its full operating range.
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REQUEST BULLETIN 261

S-A
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plants companies personalities

Companies appoint research executives

Johnston | Bittenbender | House | Heineman

Dr. William R. Johnston, who began his career with Standard Brands in 1931, has resigned as that company's vice president in charge of research to assume the same title and functions at **International Milling Co.,** Minneapolis. He replaces Dr. H. H. Schopmeyer, who recently resigned as director of research.

Appointment of **Dr. William A. Bittenbender** as corporate director of research for **The Glidden Company** gives him over-all responsibility for organizing, planning and directing company research programs, including those in the three main operating divisions — Durkee Famous Foods, Paint and Chemicals.

Andrew Wolf has been appointed director of new products — a newly created position — for the **Kitchens of Sara Lee, Inc.,** Chicago. He has been director of product development for a large commercial bakery, product development consultant for another major baking firm and has owned his own retail bakery.

Wolf | Levey

The Felton Chemical Co., Inc., Brooklyn, has appointed **Victor M. Levey** research director. Since 1953, he had been technical director at Tragacanth Importing Corp., New York.

Plan Foods and Research Company has appointed **Dr. William B. House** director of research. While in his recent post as principal chemist at Midwest Research Institute, also Kansas City, Dr. House developed the formula for PLAN, now the largest-selling fresh, dairy-processed liquid diet drink on the market.

Reflecting increasing emphasis on research and development work at **Pet Milk Co.,** St. Louis, is the election of **Harry E. O. Heineman,** director of research and development, to the newly created position of vice president — research and development.

DCA Food Industries Inc., New York, announces appointment of **Dr. Sidney M. Cantor** as vice president of research. Since 1953, he had conducted his own consulting service, with offices in Ardmore, Pa. Previously, he had been director of research for American Sugar Refining Co.

Harold L. Janovsky, formerly head of Fritzsche Brothers, Inc. Flavor Laboratories, has been appointed to the newly created position of technical director by **Florasynth Laboratories, Inc.,** also New York.

A. F. Murch Co., Paw Paw, Mich., processor of fruit juice products, has appointed **Norman F. Roger** director of research and quality control. For the past four years, Roger has served as project leader in research and development of processes for production of fruit and berry juice fully-

flavor concentrates at USDA's Eastern Regional Research Laboratory.

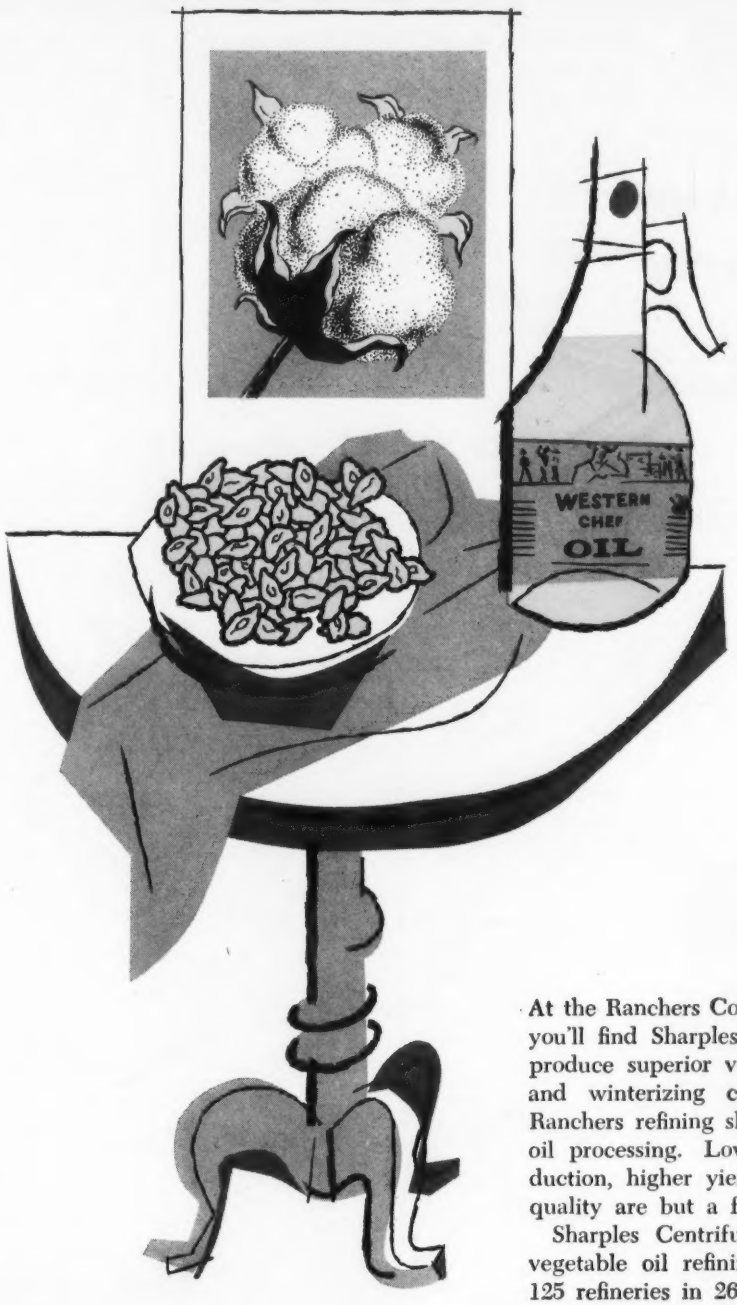
At **Oscar Mayer & Co.**, Madison, Wis., **John C. Bard** has been promoted from general product controller to director of product research for the company. He is succeeded in his former position by **Donald L. Paul,** who had been Madison plant product controller.

John M. Fox, who spearheaded the founding of Minute Maid Corporation in 1945, and has been president since the firm's inception, resigned as president and chairman of the advisory board of directors of the **Minute Maid Division of The Coca-Cola Company** to become an executive vice president of **United Fruit Company.** He had already been a United Fruit director, and retains a directorship in Coca-Cola. **Holman R. Cloud,** executive vice president and director of Minute Maid since 1945, is new president of the division. Minute Maid also announces election of vice president **William E. Speeler** to the presidency of **Minute Maid Groves Corp.**

Borden Foods Company announces several major executive appointments. **Arthur B. Erekson,** vice president in charge of research and development, has been named vice president in charge of production. **John O. Grom,** assistant to Erekson and a Borden Foods assistant vice president, will assume administrative responsibility for the research and development department. **James F. Hale,** formerly assistant director of Borden Foods Company's Research Centre at Syracuse, N.Y., has been appointed technical director of research and development at New York headquarters.

More news of Plants, Companies and Personalities on pps. 51, 73, 79, 81, 87.

CENTRIFUGAL SKILL AT WORK



here's another example of modern vegetable oil processing

AT ITS BEST

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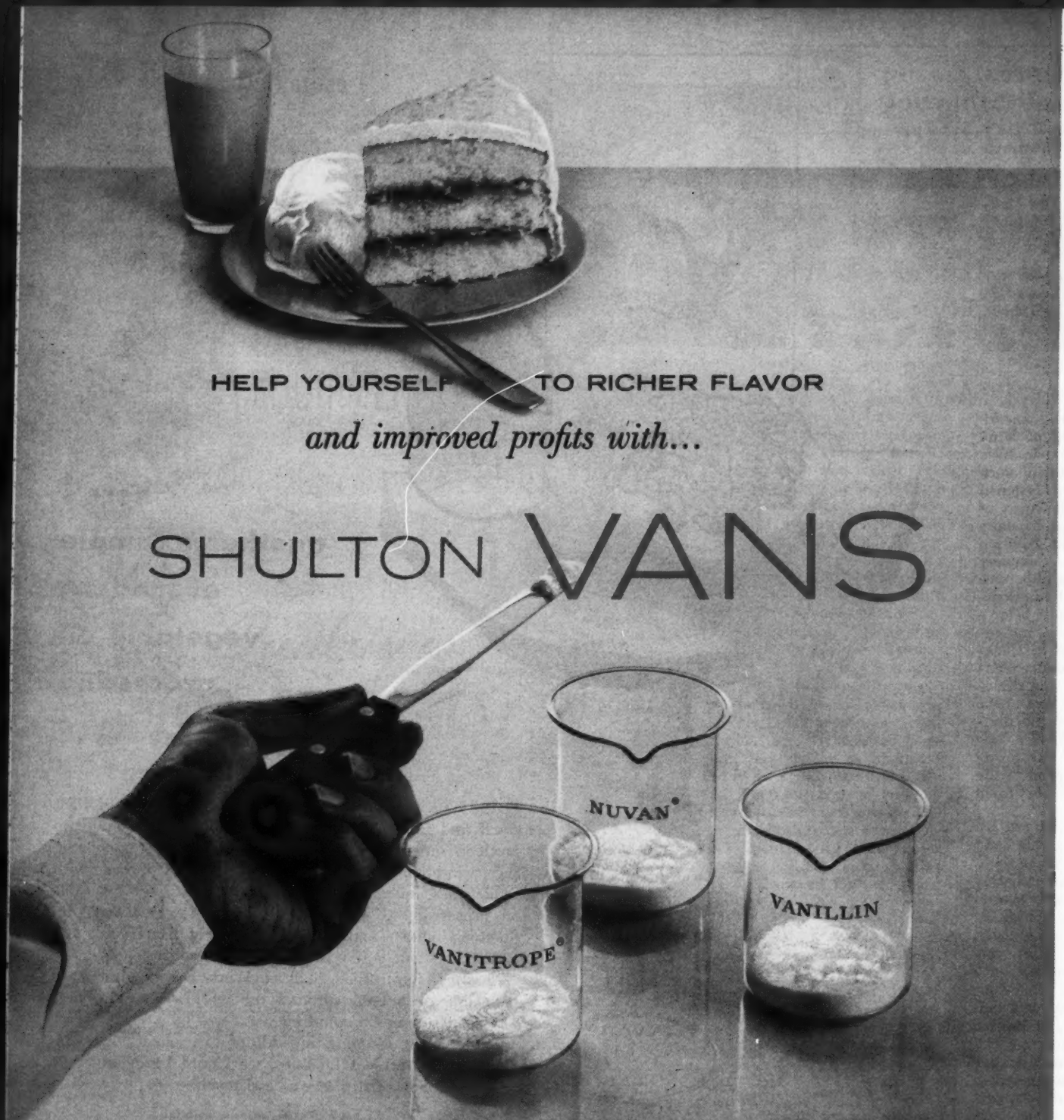

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THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE
FOOD PROCESSING
APRIL 1961
VOL. 22 NO. 4

To prevent stagnation of product research . . .

Campbell expands its program in basic food research

Dr. C. H. Krieger
Director of Basic Research and Product Development

HOWARD P. MILLEVILLE
Editor

COMPLETION of its new Food Science and Nutrition Laboratories makes it possible for Campbell Soup Company to carry on an expanded program in basic food research, and to accelerate projects under way in product and bacteriological research.

The new labs are located in Camden and in nearby Morrestown, N.J., and have 39,000 square feet of floor space. They are staffed by 90 scientists, technicians and assistants, including 17 Ph.Ds., half of whom are in basic research.

Director of Basic Research and Product Development is Dr. C. H. Krieger, who was formerly Director of the Wisconsin Alumni Research Foundation's General Laboratories.

Included in Campbell's basic research program: an intensified search for new sources of food and new uses of natural products as food, especially protein; studies on the relationship between physiological and psychological factors in digestion; the relationship between calorically-balanced diets and obesity; how flavor, color and odor may aid digestion; how various flavor constituents are registered in the mouth; how the body can use its food more efficiently.

The basic research progam is organized into nine specific categories: nutrition, flavor biochemistry, dairy products, edible fats and oils, flavor chemistry, analytical chemistry, cereals, proteins, and enzymology.

Insofar as any promise for the future is concerned, Campbell's public announcement on behalf of the labs was understandably tempered and cautious.

According to Dr. Krieger, one of the prime objectives of increasing basic food research at Campbell Soup Company is forestalling stagnation of product research.

Also, it has become increasingly evident that the food industry's progress from now on will depend more and more on basic research developments in the Life Sciences. Compared to physical sciences, the Life Sciences are not only in their early stages of development but are more difficult and complex.

As do other large progressive food companies, Campbell recognizes that the major sources of new thresholds of knowledge about foods and nutrition — breakthroughs in the Life Sciences — will continue to come from govern-

Campbell expands basic food research continued

One of the 20 labs making up Campbell Soup Company's new Food Science and Nutrition Laboratories, which also includes a pilot plant where new products and processing techniques are scientifically investigated, and experimental kitchens where chefs assist in the development of new products or in the improvement of those already on the market

Dr. A. E. Denton, Director — Basic Research, a program which includes search for new sources of food, studies on the relationship between calorically-balanced diets and obesity and attempts to learn how the human body can use food more efficiently

ment sponsored research and especially the fundamental studies underway at the colleges and universities.

Hence, the company has been rather generous in its financial support of such work. Recent grants include $189,800 gift to the University of Wisconsin to complete the funds needed to build and equip a genetic research building, a $1,000,000 unrestricted grant to Massachusetts Institute of Technology. Previously it granted MIT another $1,000,000 to further its nutrition and food science program.

Not long ago, a $225,000 Campbell Plant Research Laboratory at California Institute of Technology was dedicated to the task of making it possible for plants to grow in a wider variety of climates.

Growing crops in more localities and preserving them more effectively than possible at present are results which Campbell anticipates will markedly lessen the many costs presently involved in storage and transportation of fresh foods.

In any event, Campbell is doing its part in accelerating the occurring of breakthroughs that will be coming in the Life Science. . . and is expanding its own basic research program to have the scientific and technical know-how necessary to capitalize on them as they occur.

Campbell is thus well along on research which will prepare it for the diet-conscious market which some experts predict will become the outstanding characteristic of the food market in the 60's (page 42, March Food Processing).

How Dr. Krieger views this phenomena is revealed in the current issue of the *Stanford Research Institute Journal:*

"Greater changes in the American diet will be realized in the next 20 to 40 years than have been experienced during any equivalent period.

"Marked increases in basic research efforts on the part of the food industry and a closer relationship between industrial research and that of academic and governmental institutions will spearhead this achievement.

"This fundamental research work will disclose more and more information on the importance of the qualitative aspects of fats, proteins, carbohydrates, and other food components in the diet.

"Emphasis will shift from food quantity to food quality. Greater and better dissemination of truthful interpretations of these scientific findings will focus attention on the importance of a proper diet. In other words, the average American will eat better, and those who are overeating will eat less.

"Convenience foods, be they heat processed frozen or dehydrated, will have a great impact on the American dietary habits. Although canned foods have been used over a century, convenience food usage is still in its infancy.

"Despite a logarithmic growth in the use of fresh-frozen and frozen-prepared foods in the last decade, only a small percentage of the total food consumed is frozen. New concepts of preservation and concentration are being developed which indicate that such foods will find an even more important niche in the diet.

"Canned or heat-processed foods will continue to improve in quality and be a main convenience food item." END

Automatic tomato line...

Big savings at Gangi Bros. Packing Company

Cores, peels, trims; vac syruper adds puree, gives close head-space control for steam-flow closure

A. R. GANGI, Partner
Gangi Bros. Packing Co.
KARL ROBE, Associate Editor

PROBLEM: At Gangi Bros. Packing Co., Santa Clara, Calif., 44 women cored, trimmed and hand-packed tomatoes on the No. 10 canning line. Steam peeling was used, followed by manual removal of the loosened skins.

Puree was added previous to filling. Cans were closed on vacuum seamer.

With costs mounting faster than price of finished product, further mechanization became imperative.

Solution: Production line for 1960 season was revised to include an FMC tomato peeler, hand-pack filler and pre-vacuumizer syruper, and an Angelus steam-flow closing machine.

The automatic peeler replaces manual removal of skins and manually operated corers.

Six women feed this machine, placing the tomatoes in holding cups, stem end down.

Machine centers and aligns product, applies temperature- and density-controlled caustic solution, removes core, blossom end and skin. Peeled and trimmed tomatoes then receive a double wash before discharge.

Pre-vacuumizing syruper removes air from can and contents, then fills tomato puree to a controlled head space. Headspace accuracy is approximately plus or minus 1/32nd inch. There is no puree wastage.

This accuracy makes steam-flow closing machine feasible. The headspace is exhausted with steam, then cover is seamed. Vacuum forms when steam cools and condenses.

Line operates at 22 cpm on No. 10 size. Filler and syruper capacities are 55 and 85 cpm, in anticipation of future production requirements.

Results — Operational: Operating expense has been substantially reduced for tomato preparation and filling.

In place of 16 women coring and 22 removing skins and filling cans, now 12 women pre-select tomatoes, rejecting under- and over-sizes and damaged tomatoes.

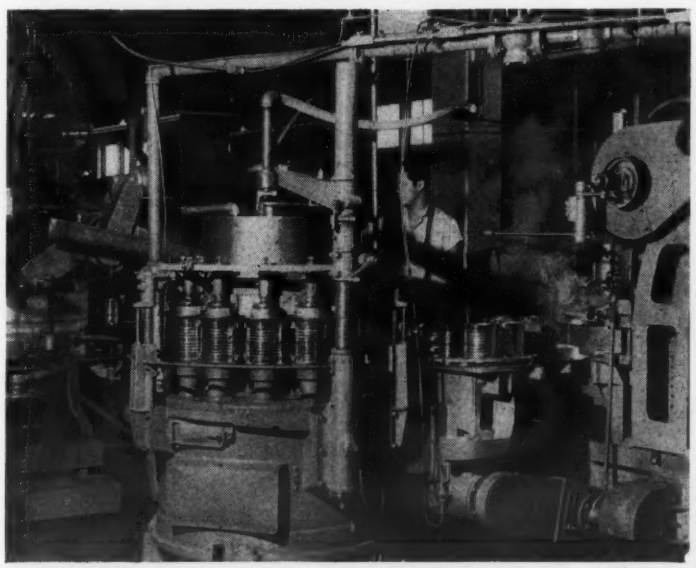
Six women feed tomatoes at peeler, two sort at end of peeler, and two more operate the filling machine.

These numbers are aver-

continued bottom page 34

FMC Model 300 Tomato Peeler, FMC Hand Pack Filler and FMC No. 12 Pre-vacuumizing Syruper are products of Food Machinery & Chemical Corp., Canning Machinery Div. Western: P. O. Box 1120, San Jose 8, Calif. Eastern: Hoopston, Ill.
6337 on Reader Service Slip.

Angelus 50 P Closing Machine with Steam Vacuum Attachment, 75 cpm capacity, is product of Angelus Sanitary Can Machine Co., 4900 Pacific Blvd., Los Angeles 58, Calif.
6338 on Reader Service Slip.



Peeler-corer machine aligns tomatoes after they are placed stem-end down on flights

Vac syruper, center, adds hot puree after tomatoes are filled

Maximizing production of a canning line

How Hume maximizes production through planned disorder was the subject of the first three articles in this series which appeared in FOOD PROCESSING last month. These first three articles described how production from different fillers is coded, then sent through common cookers and unscrambled at palletizing stations. Other innovations which speed handling are described this month.

Part IV Keep empty-can lines filled

Regardless of fluctuating demand, can-sensing instrumentation stops and starts lines to keep them full, prevent jams and cable burns . . . also prevents jams of filled cans to automatic palletizer

THOMAS D. BIRCHALL, General Manager
G. W. Hume Co.
KARL ROBE, Associate Editor

Automatic Canco depalletizer (right) feeds 16' high Peco air elevator (left)

From depalletizer, empty cans (right) cross highway to main plant. Filled cans return via lines on left

PROBLEM: G. W. Hume Co., pioneer canners at Turlock, Calif., outgrew their original site, but adjacent land was unavailable. Therefore, they built a new warehouse across Highway 99.

With can handling operations (both empty and full) in the new warehouse almost a block away from fillers, some kind of fool-proof can-line control system became necessary to prevent jams, cable burns and to handle fluctuating production demands at fillers.

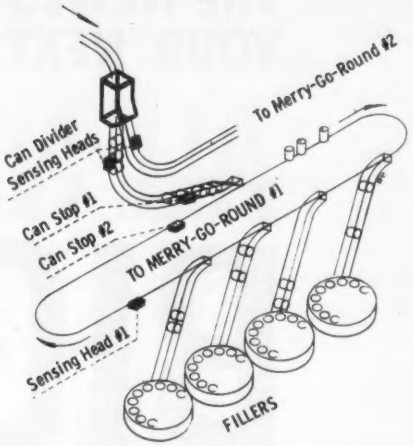
An additional problem arose when conventional can dividers, made for slower speeds, could not handle the 675 cpm output from main depalletizer line into separate streams going to fillers.

Solution: Proximity controls with built-in, adjustable time delays were installed at key points at the depalletizer and at the infeed line to fillers.

Two proximity controls are interlocked to stop depalletizer and conveying lines after cans back up past a sensing head in main cable line, and then to start the line and palletizer as soon as demanded by the filler lines.

One control (Peco Model MS, Peco Corp., Mountain View, Calif.) performs two jobs in sequence. When cans back up to sensing head located approximately 50 ft

Sensing head detects cans by magnetic proximity principle, does not touch or obstruct cans



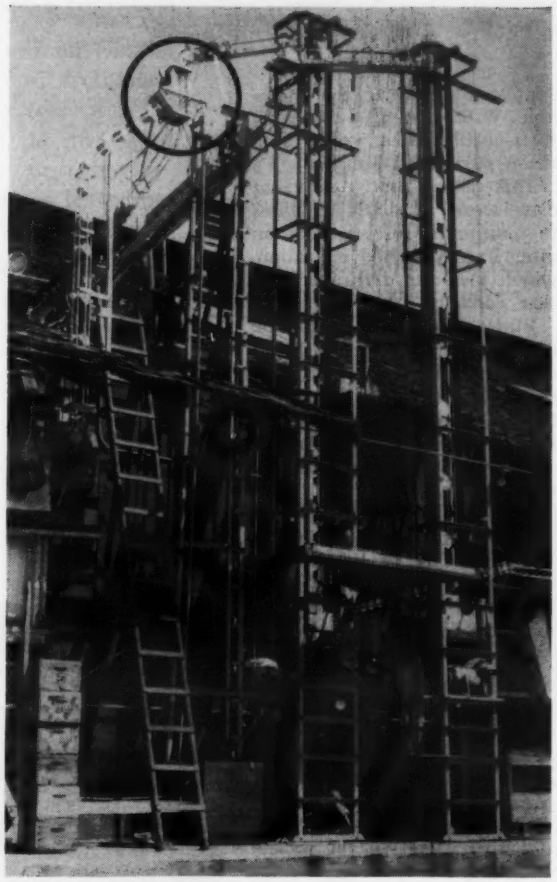
Cans enter plant from main line through electromagnetic divider (circled in photo at right) which divides main stream (675 cpm) to branch lines on demand of either branch. Divider diverges can flow to branch lines on demand.

Branch line takes can to "merry-go-round" (see diagram), from which five to eight filler lines are kept supplied.

As excess cans accumulate behind Can Stop #2 (which normally is closed), Sensing Head #1 operates Can Stop #1, which stops cans from entering "merry-go-round."

After a pre-set time delay (to prevent two lines from feeding at same time and causing a jam), a second relay releases the accumulated cans behind Can Stop #2. Thus, surge capacity is provided with minimum holding time for the reserve cans.

In meantime, during the work stoppage, can divider has continued to supply inlet branch lines with cans until this section is full — providing additional surge capacity



ahead of depalletizer, one relay in control stops depalletizer can-feed motor.

After a pre-set time delay varying from 1 to 10 seconds, depending on line requirements, a second relay operates, shutting off cable line. Cans already discharged from depalletizer fill most of remaining 50 ft of line behind the sensing head, leaving a few feet safety factor.

With the long cable line now completely full of cans, and with cable motor idle, it was necessary to restart cable line on demand of filler line in main plant.

To accomplish this, another sensing head (Peco Model H) was located in the main-trunk gravity line going to fillers.

As soon as fillers need cans, cans in gravity line start rolling. The Model H sensing head (see photo) detects this can flow. After a short delay to phase out short stop-start cycles, Model H Proximity Control, which is interlocked with the second relay in Model MS depalletizer proximity control, then restarts the cable line.

Model MS sensing head detects motion of the cans, and MS control then restarts depalletizer can-feed motor, after suitable delay to phase out short stop-start cycles.

The high-speed main line stream of cans coming from depalletizer at 675 cpm is handled by an electromagnetic divider (see diagram).

Cans are switched by electromagnetic action into the branch line demanding cans. Each branch line has a sensing head connected to divider control panel.

When cans back up in either line to proximity sensing head, divider switches cans to other line.

If both lines are full, proximity controls actuate an electromagnetic can stop ahead of divider, stopping inflow of cans and preventing jams.

Controls deactivate the can stop when either branch line again needs cans.

Results: Automated can lines furnish in-transit surge storage of empty cans. This surge storage operates as a buffer against production fluctuation, and a noticable reduction in downtime problems is apparent.

When one or more fillers stop and then restart, a surge

FILLED CANS Problem-Solution: Filled cans on conveyor in rear are automatically routed into proper palletizing station in warehouse by electric-eye sorting system. High volume codes go to two Hume-built automatic palletizers (See March 1961 FOOD PROCESSING).

Since these palletizers run unattended, controls are needed to prevent jams whenever infeed of cans to palletizer is temporarily greater than its capacity.

A proximity control (Peco, Model H) is used to sense backed up cans in the infeed line shown in foreground of photo.

When infeed line to a palletizer is full, this control overrides the electric-eye, magnetic-can diverter of the unscrambling system, thus allowing cans to proceed to another station until palletizer station can again handle more cans

supply of cans is always available. Without time delay controls, cable lines would stop when partially filled.

This meant that insufficient cans were available in lines to maintain full production after lines resumed operation, which lowered daily production capacity.

With time delay control, infeed of cans continues in cable lines until sufficient supply has accumulated in reserve to sustain production once the fillers resume full operation.

Now that adequate in-trans-

Peco time-delay proximity controls and divider (patents pending) and air elevator for empty cans are developments of Peco Corp., 111 Ortega Ave., Mountain View, Calif. 6339 on Reader Service Slip.

it surge storage is available, the three operating entities at Hume (empty can feed, production, and filled can storage) can work almost independently of each other. Most stoppages, breakdowns, or minor maintenance chores at either end of line can be handled without stopping production in the other phases.

Hume has found that the automated control system and long surge storage line has smoothed production of entire plant, increased effective productive capacity, and reduced jams and stoppages caused by can line malfunctions. END

Automatic Tomato Line

continued from page 31

ages. More or fewer women may be needed at different points, depending on conditions and volume of product.

Results — Quality: Machine operation results in uniform top quality pack. Filler, pre-vacuumizing syruper and seamer combination provide much more uniform fill than former filler and vacuum closing machine.

After first season's operation, vacuum range on cans has been consistently within the 10″ to 12″ range. END

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FORD DIVISION, Ford Motor Company

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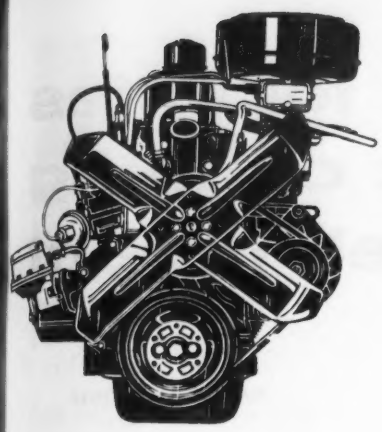

Now, the rugged simplicity of a big 262-cubic-inch Six is combined with the dependability of heavy-duty, *exclusive-truck* engine design. In a grueling 40,000-mile test of reliability, Ford's new Big Six was pitted against its principal competitor in the 2-ton field. Result: Ford's new engine required far fewer service adjustments. This means less time in the shop . . . more time on the job.

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3. **Exclusive 100,000-mile warranty** (or 24 months) on 401-, 477- and 534-cu. in. Super Duty V-8's. Each major engine part (including block, heads, crankshaft, valves, pistons, rings), when engine is used in normal service, is warranted by your dealer against defects in material or workmanship for 100,000 miles or 24 months, whichever comes first. Warranty covers full cost of replacement parts . . . full labor costs for first year or 50,000 miles, sliding percentage scale thereafter.

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5. **Sales engineers and service specialists** in 36 district offices are on call to solve special truck problems. Working with both dealers and customers, these experienced truck men represent another extra step Ford takes to provide your continued satisfaction.

6. **Replacement parts depots** at 26 strategic locations across the country quickly supply needed parts from ample stocks. Ford's entire supply system is geared to give you faster service and reduce costly downtime . . . *wherever* you are.

7. **6,800 Ford Dealers,** including 273 specialized Heavy Duty truck dealers, can keep your trucks ready to go wherever they go. From coast to coast, fast Ford service—gas *and* Diesel—is always close at hand.

From Super Economy pickups to Diesel-powered tractors, you can now fill every truck need up to 76,800 pounds GCW with a modern, money-saving Ford Truck.

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New food radiation facility

. . . now underway for Army Quartermaster

Earlier pioneer studies to learn if controlled radiation can preserve all kinds of foods in safe and edible condition for indefinite periods will be continued at a new radiation research station about to get underway at the Quartermaster Research & Engineering Center, Natick, Mass.

The facility is the direct outgrowth of previous studies made by the Quartermaster concerning use of radiation for preservation of food.

Encouraging progress has been made in the Army's program on radiation sterilization of meats for extended periods without refrigeration.

The Army program — administered by The Quartermaster General — concentrates on total sterilization, to preserve food for long time periods.

(A concurrent Atomic Energy Commission food radiation program is aimed at radiation "pasteurization" of fruits and fishery products, for extension of their refrigerated shelf life.)

Station will house a one-million-curie cobalt-60 gamma source, the largest such in the U.S., as well as a 24 Mev (million-electron-volt) linear accelerator, to irradiate foods with high-velocity electrons.

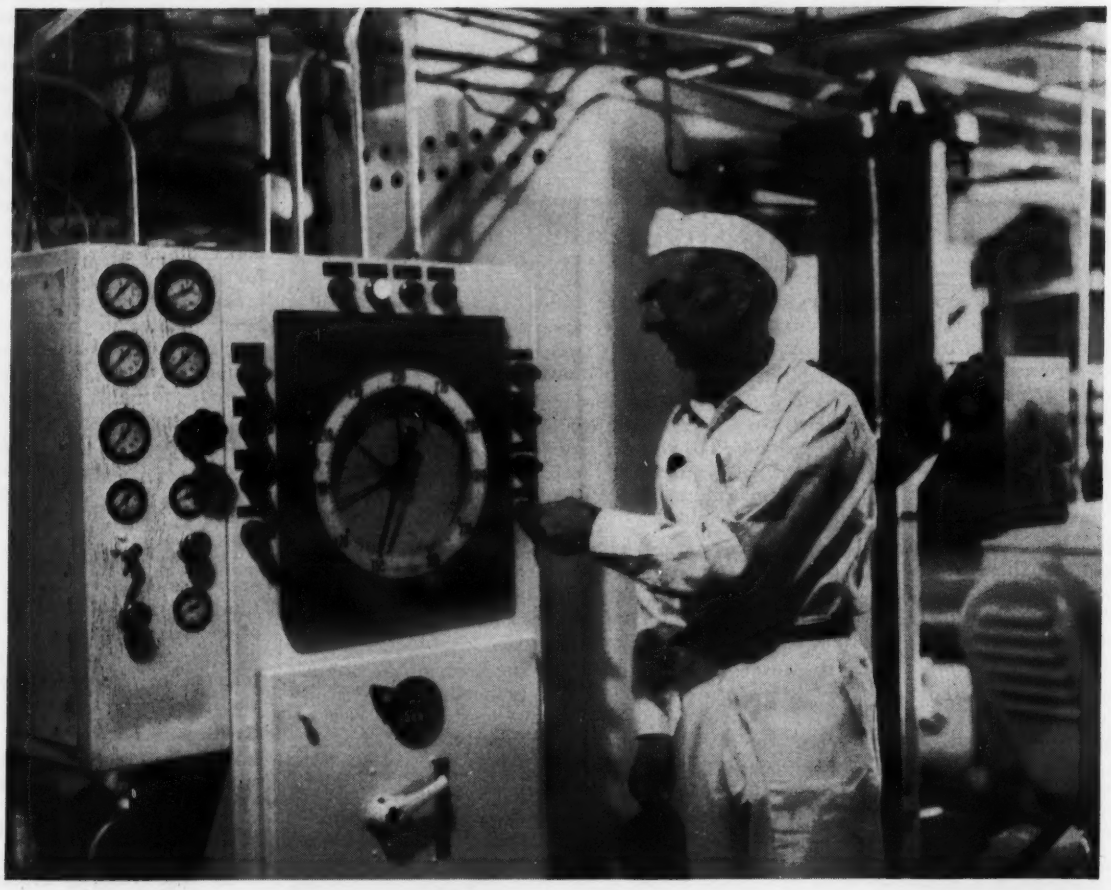
The gamma installation is being designed by Curtiss-Wright Corp. Varian Associates, of California, is building the linear accelerator.

The experiments are expected to yield valuable data for evaluating the two irradiation methods.

Associated Nucleonics, Inc., Garden City, L.I., a subsidiary of Stone & Webster Engineering Corp., and one of 28 firms submitting proposals, has been selected by the Atomic Energy Commission as architect-engineer for the $1.8 million installation. END

Offer processors facilities for aseptic canning research and development

MARION P. LANKFORD
Assistant Editor

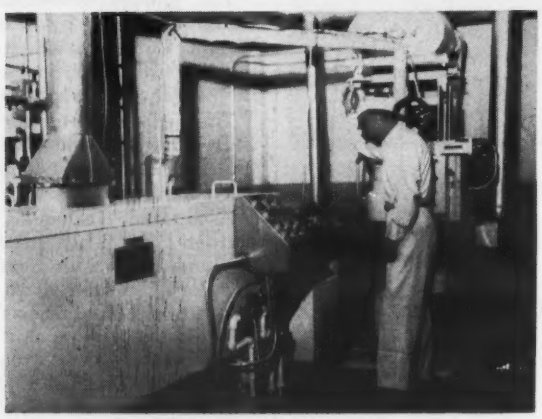


EXTENSIVE or limited research and development projects in aseptic canning and/or Ultra High Temperature Short Time processing can now be carried out in a pilot plant on a fee basis.

Complete pilot model processing and canning facilities have been assembled by Amboy Sterile Packaging Company, Amboy, Illinois, and is under the direction of personnel who have worked in the aseptic field for a number of years.

Facilities available for work in Ultra High Temperature-Short Time processing include tubular, steam injection, swept surface, and plate heat exchangers. These units can be used singly in a process or in various combinations. A Model 60 Dole unit is available for aseptic canning of the products.

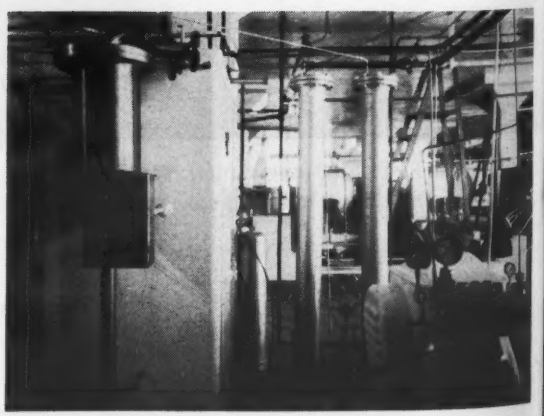
These facilities offer processors an opportunity to determine for themselves just what advantages might be found in the application of



▲ Operator is making an adjustment at instrument panel which controls heating and cooling of product in the steam injection system

◀ Steam cabinet in front of the operator sterilizes empty cans and fills them in the Dole Aseptic Canning unit

Roto-Jet steam injection heater and ▶ vapor cooling are combined in one unit shown in the left foreground. A vertically mounted shell-and-tube heater and cooler are located in the middle background behind the homogenizer. Other equipment in the plant provides for heating or cooling by use of a swept surface heat exchanger and also by use of a plate exchanger



A 10 gallon test quantity, minimum required for a complete test, is being dumped into one of the small premix tanks used to formulate raw ingredients

UHT-ST processing and aseptic canning.

Marked improvement in color, flavor and vitamin retention are some of the advantages offered.

Cold formulation is another advantage. This is a new application of aseptic canning which is of particular interest to processors who want to compound ingredients that are not compatible at high temperature. Separate components are individually sterilized and cooled. They are then mixed and packaged aseptically.

This new technique of cold formation promises broad technical advances for developing products which could not be processed using conventional techniques.

Trial runs as little as 10 gallons of product or as much as several hundred gallons might be involved in an experimental trial.

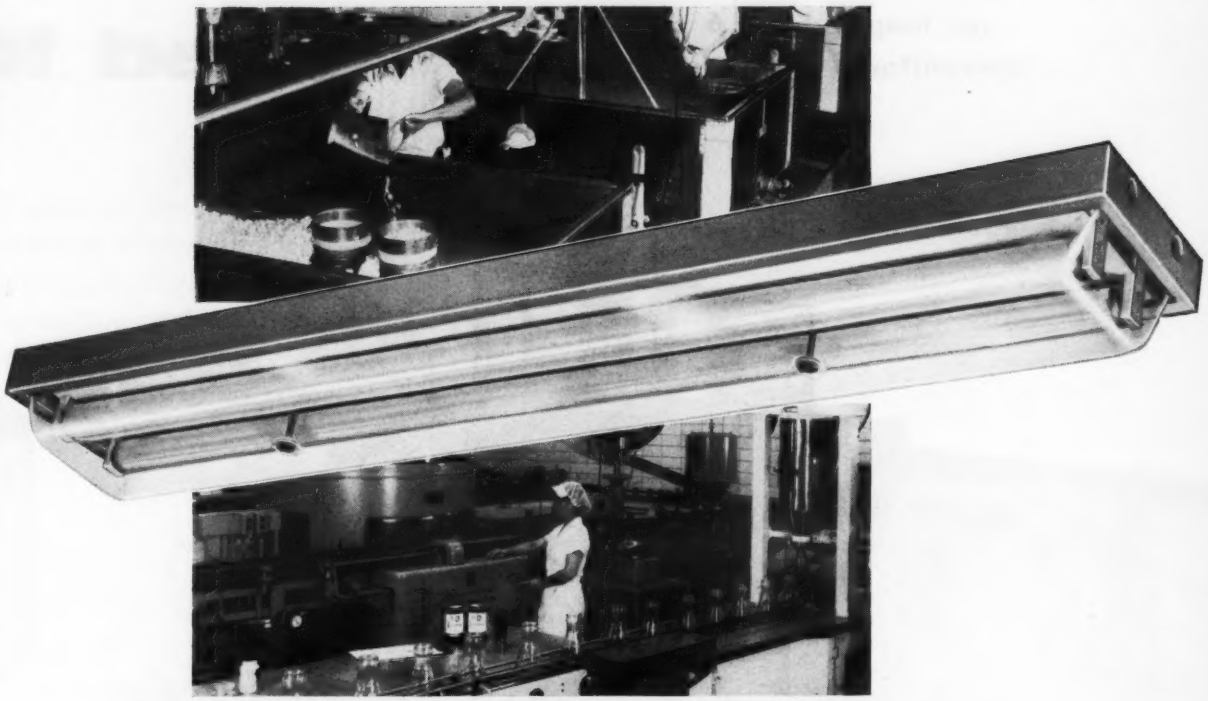
Experiments involving milk or some similar non-acid product might require the following process: heat to 290 F hold for a period of 12 seconds then cool to a temperature of 80 F or less.

Superheated (dry) steam at a temperature of 490 F sterilizes cans and covers in the Dole system. Cans are then filled with cooled sterilized product in a heated steam atmosphere and sealed before leaving the steam atmosphere.

Other services planned include research personnel training, production of market test samples, engineering, and planning new systems. In addition to the pilot plant, plans have been completed to provide production facilities for custom packaging.

6341 on Reader Service Slip.

Bright News for Food Processors



The CLEAN-LITE

Another "first" from Wheeler Research — the CLEAN-LITE, is a new, sanitary, semi-dustproof, low cost fixture especially designed for the food processing industry. This unit meets the needs of bakers, candy makers and all other food manufacturers or processors whose quality control demands the highest sanitary standards.

Reflector and all exposed surfaces are baked gloss enamel for easy maintenance and continued high efficiency. A smooth Plexiglass diffuser fits snugly against a continuous gasket, thus preventing the accumulation or circulation of dust. Relamping is readily accomplished by undoing two knurled nuts and reflectors are removable for attention after long service. For cold storage, refrigerators and other low temperature areas, special ballast equipment is available.

If outmoded, dust-collecting, low output fixtures are giving you problems, replace them with new CLEAN-LITES. They will aid quality control, increase efficiency and improve employee morale.

Wheeler also makes a completely sealed fixture, the Wheeler Dust-Tight, for Class II F & G hazardous locations with serious dust problems.

Send for complete details today

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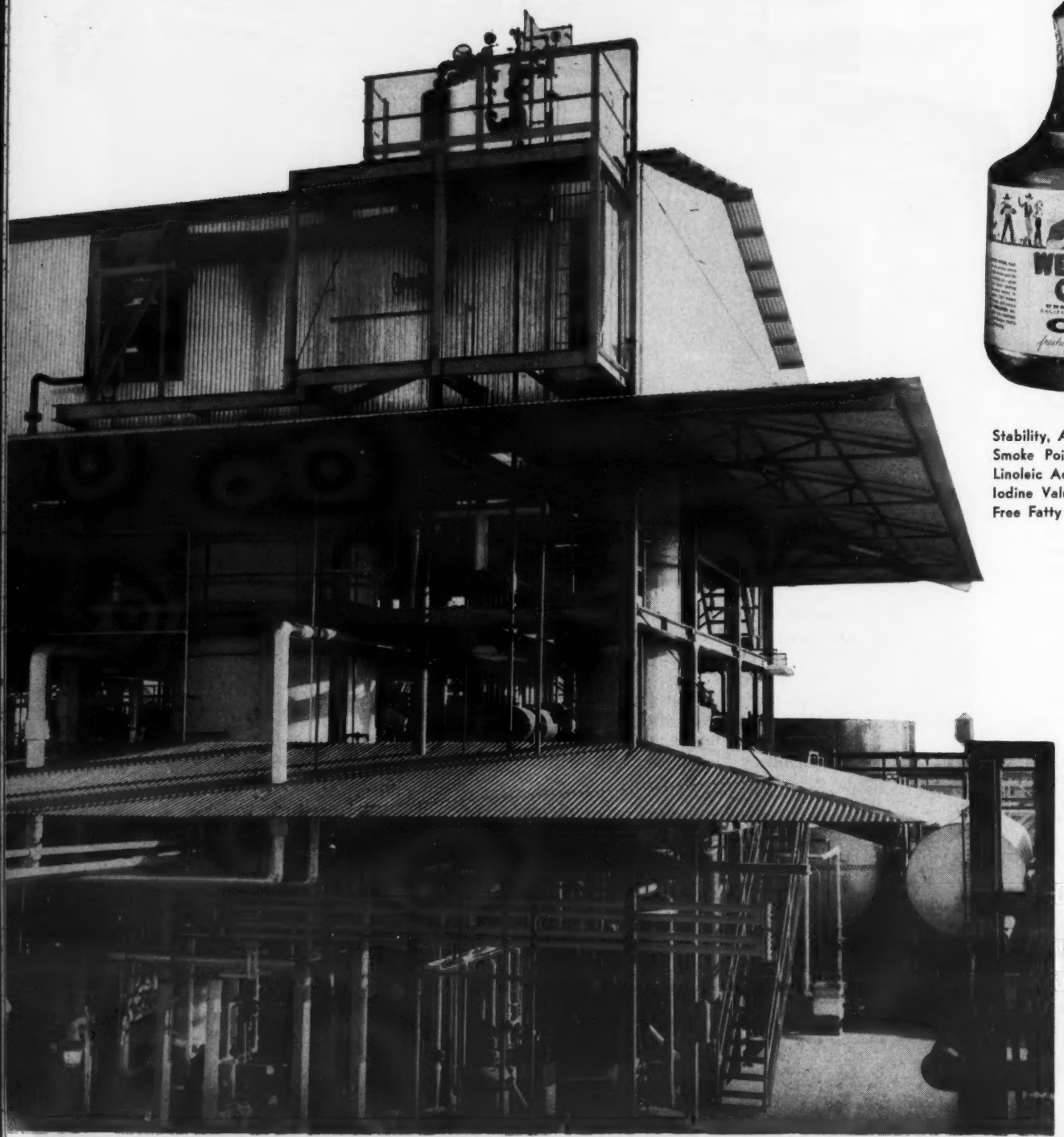
Major breakthrough . . .

in edible oil processing; no longer 5 to 6 days as in conventional operation, now . . .

Seed to salad o

Stability, AOM (Hrs at 208°F)	18 to 24
Smoke Point, °F	460 to 480
Linoleic Acid Glycerides, %	50 to 55
Iodine Value	114 to 118
Free Fatty Acids, %	0.01 to 0.03



Overall view of refinery. Deodorizer for stearine is larger column to left of center. No. 3 winterizer is column to right. Finished oil and stearine go to tanks beyond building

ad oil in 18 hours

In Ranchers' process, oil-solvent miscella of low viscosity is refined instead of straight oil to increase yield, improve quality, eliminate bleaching step. Winterizing time cut from 3 - 5 day batch to 1 1/2 - 3 hr continuous process. Centrifuge replaces expensive filtration step

GEORGE C. CAVANAGH,
Director of Research
EARL J. CECIL,
General Manager
Ranchers Cotton Oil Co.

KARL ROBE, Associate Editor

PATENTED continuous refining process for food oils, developed by Ranchers Cotton Oil Co., a cooperative at Fresno, Calif., is successfully producing on an around-the-clock basis, the "lightest color oil in the industry."

Finished salad and cooking oil is in the storage tank 18 hours from the seed. Ordinary processes require 3 to 5 days for winterizing alone.

This article first presents a quick synopsis of conventional processes for comparative purposes, then describes the process depicted on the flow diagram on the fold-out sheet. It concludes with a listing of the many advantages of the new process.

Conventional refining processes are a series of operations which include extracting the crude oil by pressing and solvent extraction. Solvent is next removed from oil in evaporators and from cake in steam-jacketed dryers.

Either soda ash or lye is added to the crude oil to saponify or agglomerate free fatty acids, gossypol, and other unwanted materials.

Centrifuges separate the resulting soapstock, which removes most of the insoluble solids. Oil fraction is washed with water, and the water, lye, and soluble solids are removed in a second centrifuge.

The remaining small amount of water must then be removed in a vacuum evaporator to avoid its causing trouble by freezing out during winterization.

Oil then passes through a bleach filter to winterizing tanks. This is a batch operation which requires careful surveillance during a 3- to 5-day period of slowly dropping temperatures, during which the stearines (saturated triglycerides which cause cloudiness in refrigerated oil) are crystallized.

At the proper time, the relatively fragile crystals are removed by careful filtration. The oil is cold, thick, and viscous, and flow rate is slow. The process requires careful attention and is generally carried out in a refrigerated room.

If filter pressure is raised above 6 psi, filter cake is compressed and flow stops altogether.

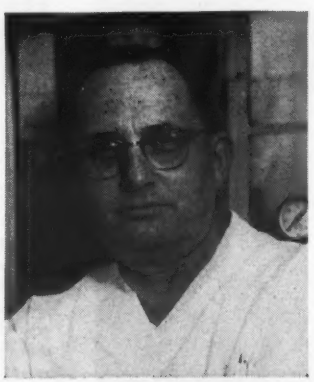
The stearines removed in this process are usually dark in color and contain excessive amounts of soap. They must be refiltered and sold at a lower price than the winterized oil. Entrained oils which remain in the stearine represents financial loss.

Wintered oil is frequently bleached a second time, then deodorized under vacuum for marketing as salad and cooking oil.

Ranchers' solution: Ranchers decided to attack the entire process instead of individual operations. One major change occurs early in the process.

INNOVATION: Miscella Refining

Conventional refining processes remove solvent from crude oil before refining. In many cases, this crude is extracted at one location and shipped to a separate refinery.



George Cavanagh, inventor of Ranchers Process

Ranchers maintains a supply of seeds sufficient for year-round oil production. Therefore, they reasoned thus: Why process the heavy, viscous oil, when higher flow rate and more efficient filtering and centrifuging could be obtained by processing the low-viscosity miscella. (Miscella is the term commonly used in oil refining to designate the solution of oil in solvent.)

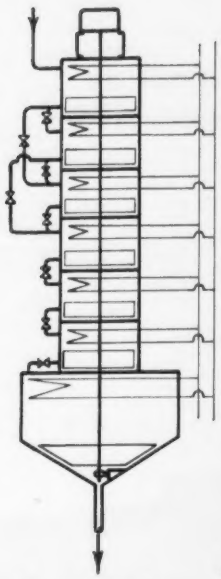
The improved flow characteristics show dramatically when absolute viscosities are compared: 3.1 lb/ft hr (1.18 centipoises) with 40% cottonseed oil in n-hexane as compared to 83 lb/ft hr (51.78 centipoises) for 100% cottonseed oil, both at 100°F.

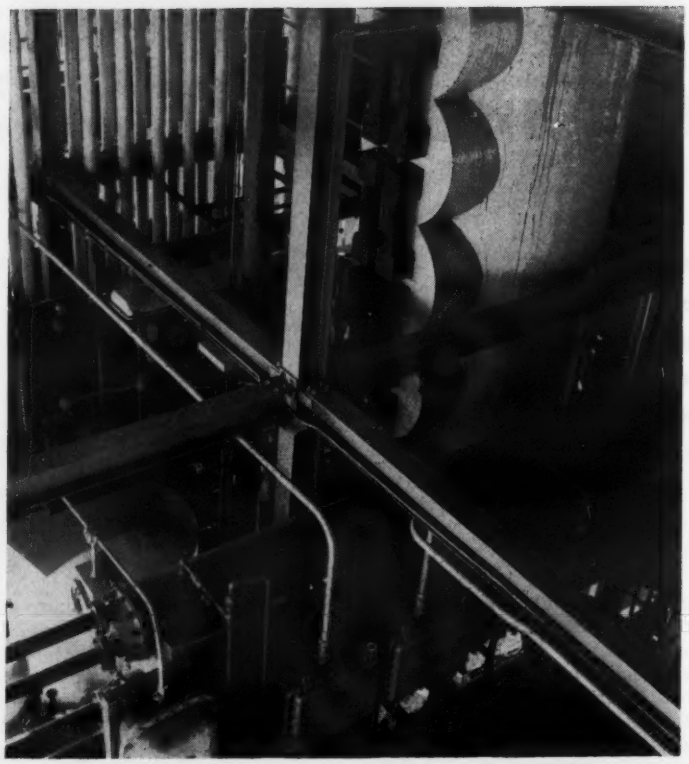
In the past, others have tried miscella refining without commercial success because of dark color of oil produced. At Ranchers, the miscella process produces a light color oil that requires no bleaching.

INNOVATION: Add Soda Ash Sooner

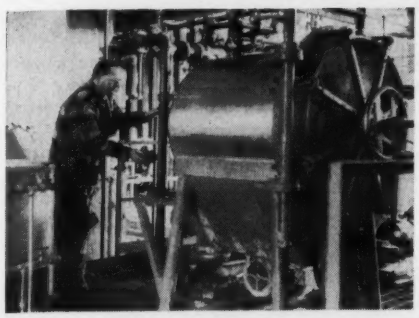
At Ranchers, granular soda ash (non-toxic sodium salts, primarily carbonate) is added to the moist cooked meats

Seed to salad oil in 18 hours continued

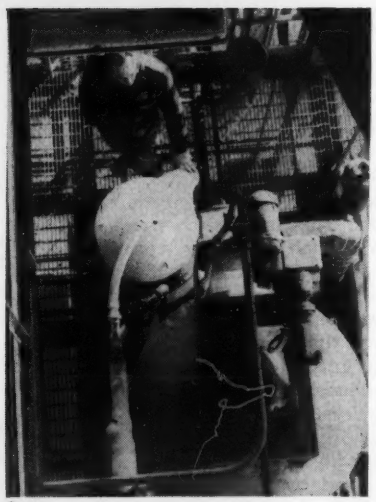




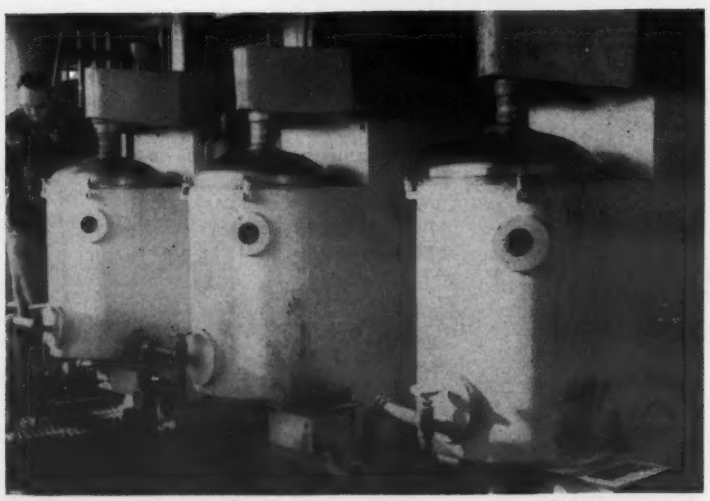
Ranchers continuous winterizer — insulated column shown in photo, cross-section above. As oil feeds down from compartment to compartment, temp becomes increasingly lower. Paddles on central shaft slowly agitates cold miscella to hasten crystal formation. Discharge temp is as low as minus 5° F



Self-cleaning filter removes trace impurities from miscella after soapstock centrifuging, replacing a conventional secondary water-wash operation



This view looks down on stearine removal centrifuge, covered with frost operating on minus 5° F oil from winterizer (see cover for enlarged view)



Soapstock removal centrifuges give higher oil yield on the low viscosity oil — solvent miscella than on straight oil. One unique feature of this installation is that the bowls are cleaned in place. The unit is simply shut off so the bowl stops rotating, the valves are adjusted, and hot detergent solution introduced for a short period of time to completely clean the bowl

after discharge from the cooker, in the initial part of the process. The meats themselves (10-12% moisture) furnish the moisture for controlled dissolving of soda ash.

This innovation resulted in two divergencies from conventional processing:

One: The salts react with free fatty acids, toxic gossypol, and other unwanted materials over a longer period during subsequent processing and mixing. Gossypol is converted to a non-toxic form and subsequent removal or neutralizing steps are unnecessary.

Two: At point after meal and oil are separted, lye is added to remove unwanted materials. In conventional process 20-40% lye is added to the oil; Ranchers now adds dilute lye (7-12%) to the miscella.

INNOVATION:
Dilute, Homogenize

In the Ranchers process, the oil-solvent-dilute lye mixture is recycled from 15 to 90 seconds in a Manton-Gaulin homogenizer. Homogenizer has excess capacity to handle 10-20% more than the process flow rate.

It is fitted with a by-pass line to recycle the excess flow, which insures intimate mixing. This intimate contact of caustic-miscella mix in homogenizer is responsible for efficient color removal.

No additional heat is added at this point, in contrast to conventional processes which require 20 to 30 minutes of continuous agitation at elevated temperatures.

The Ranchers method avoids excess saponification of oil and other heat-induced changes which adversely affect quality, color, and yield.

INNOVATION:
Reverse Cool/Heat Cycle

After addition of the lye and homogenization the Ranchers process again deviates from the normal process. Ranchers immediately heats,

Lift for flow diagram and continuation of text

then cools the product. In the miscella process, this has decided advantages.

By heating the miscella, the soapstock is melted; however, some of the hexane flashes to vapor which is entrapped in the froth that results from mixing alkali and oil.

When this mixture is cooled, the vapor bubbles collapse. The liquid squeezes the colloidal frothy mass, compressing and agglomerating the soapy waste material.

The two phases that result (oil soluble and water soluble) now have distinctly different specific gravities (1.06 vs. 0.80 sp gr at 110°F). This difference and the affinity of the oil for the solvent in the lighter phase allows greater centrifuge efficiency, approaching 100%.

Much of the material removed at this point probably also contributes to subsequent darkening of production in conventional processes.

Previous attempts to refine in the miscella were unsuccessful when hexane content was above 35% of miscella, because certain pigments and gums were soluble in the solvent and could not be removed. This resulted in very dark oils.

In the Ranchers process, homogenization with dilute lye makes possible hydrolization and subsequent removal of these gums and pigments in the heavy phase during centrifugation.

This makes subsequent operations more efficient, since there is a purer product with which to work. Fewer gums and other foreign materials mean less fouling of heat-exchange surfaces, higher efficiencies, lower heat gradients, and longer runs between clean-up, plus lighter color and greater stability in finished products.

On some types of oil, the conventional secondary water-washing step can be completely eliminated. Instead of water washing, refined miscella is filtered through a Hercules #316 stainless-steel, self-cleaning, pressure-leaf filter.

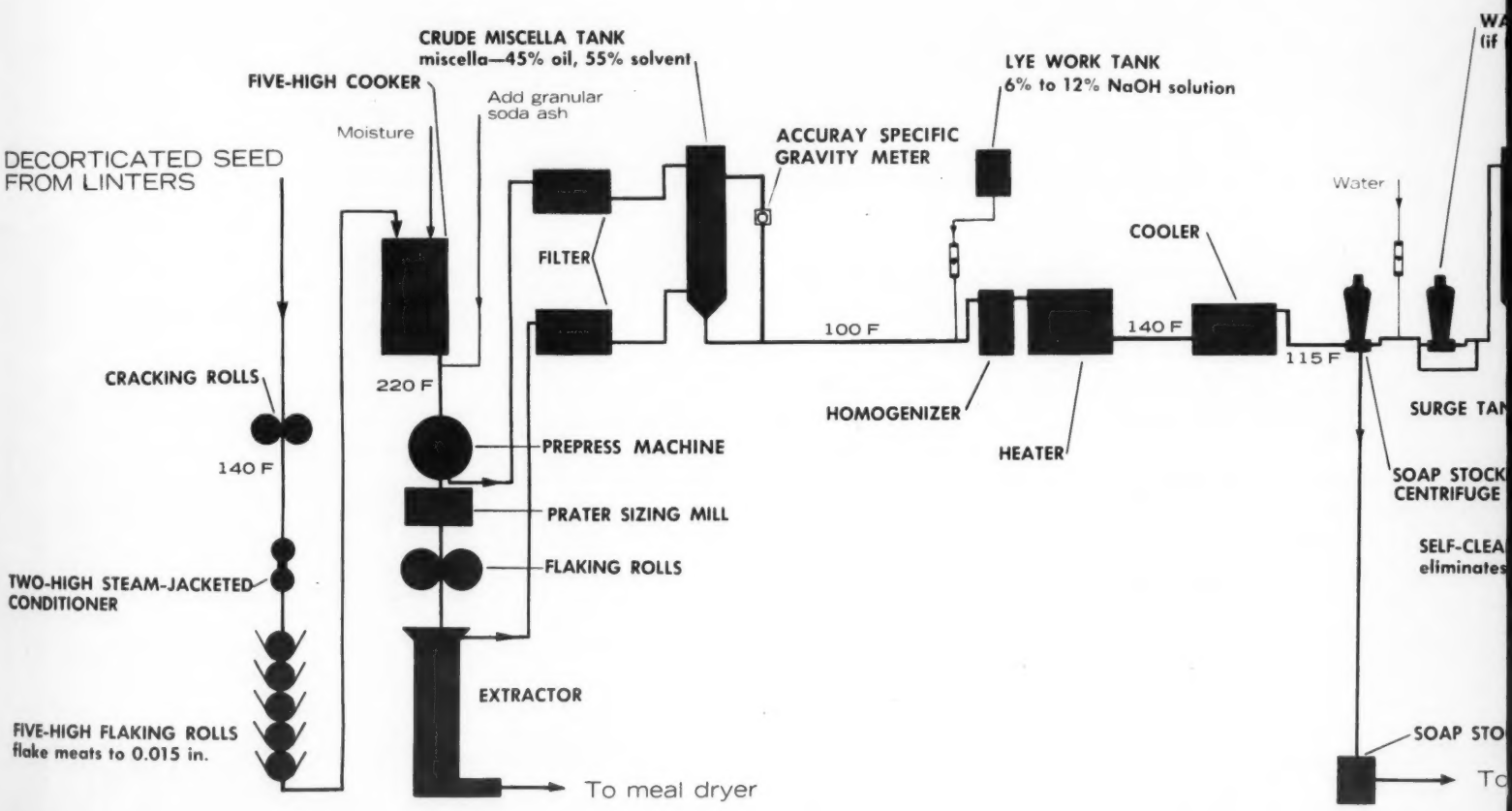
In proper service this type of filter will clean up miscella more efficiently than water washing at a fraction of the equipment investment.

After soap stock has been removed and miscella washed, the warm miscella (115°F) goes to a surge tank, then through a shell-and-tube heat economizer, where it is cooled by regenerative cold oil from winterizing process.

Miscella next passes through a refrigerated heat exchanger for fast cooling (in 20° to 26° F range), to just above critical crystal-formation temperatures.

INNOVATION:
Continuous Winterizer

The Ranchers continuous winterizer is a key innova-



FLOW DIAGRAM—RANCHERS MISCELLA REFINING PROCESS

washing at a fraction of the equipment investment.

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INNOVATION:
Continuous Winterizer

The Ranchers continuous winterizer is a key innovation. Conventional refining requires still, non-agitated oil, free from moisture, with slow, careful cooling over 3 or 4 days.

The Ranchers process uses a gravity-flow column with slow-moving paddles in each of the cooling compartments in the vertical winterizing tower (see detail diagram) and in the collecting hopper at the bottom.

Each compartment is refrigerated to a lower temperature than the compartment above. Oil enters top compartment. Retention time is controlled by regulating flow from bottom of flooded winterizer.

Moisture control of incoming oil is not critical. In fact, slight amounts of moisture in the miscella freeze as the oil cools to final temp (between 0° to 4°F) and these tiny ice crystals form nucleii for stearine crystal production.

Controlled agitation (1-10 rpm) and controlled temperature drop to zero produces harder, firmer, more compact stearine crystals in solvent which entraps less oil than conventionally.

INNOVATION:
Centrifuge Replaces Manual Filtration Process

From the continuous winterizer, miscella goes to a recent innovation in the process, a Sharples continuous solids-discharge centrifuge, which was installed in mid-1960.

This change eliminates one of the most laborious and critical manual operations in a conventional refinery . . . filtration of cold oil to remove stearine crystals.

In a conventional plant, each plate and frame press requires several man-hours to set up. It is in operation from 3 to 6 hrs depending on capacity and flow rate, then requires further time to break it down, scrape the stearine from the filter sections, and reassemble.

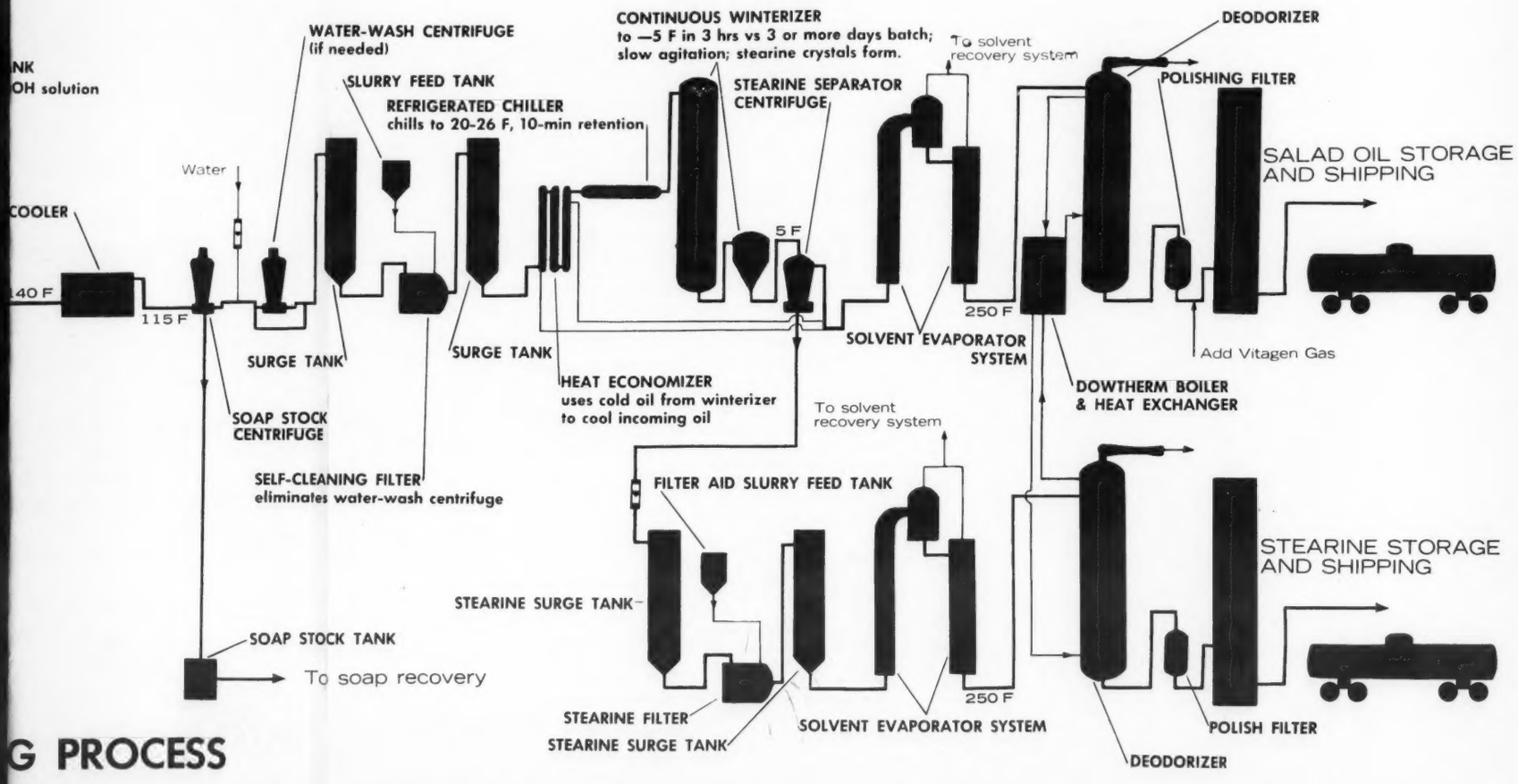
Filter cloth washing and filter aid represent added expense.

By centrifuging the cold miscella, the small hard stearine crystals from the winterizer are removed in one continuous pass and with minimum of entrained oil loss.

Centrifuge runs for 1-2 months before disassembly for cleaning.

Solids discharge from centrifuge contains 80% stearine, 20% hexane. Hexane is removed in a conventional rising-film evaporator with preheater, flash chamber, and reduced-pressure bubble cap and tray system. Solvent is returned to storage for subsequent use in extraction process.

Stearine goes to another recent addition to the process,



G PROCESS

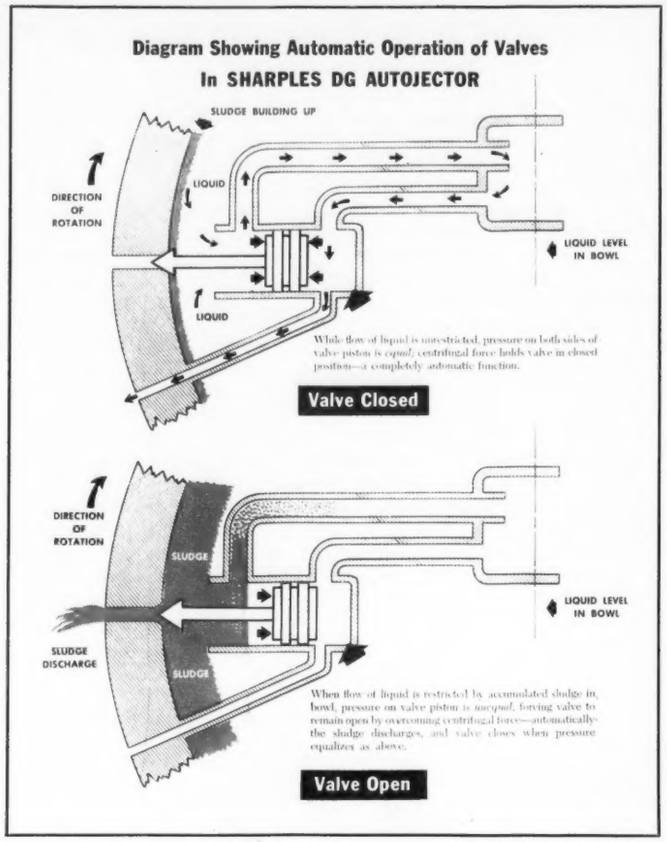
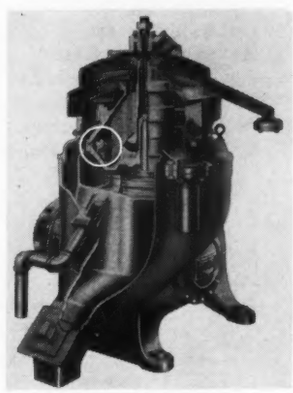


Diagram Showing Automatic Operation of Valves
In SHARPLES DG AUTOJECTOR
SLUDGE BUILDING UP
DIRECTION OF ROTATION
LIQUID
LIQUID LEVEL IN BOWL
LIQUID
While flow of liquid is unrestricted, pressure on both sides of valve piston is equal; centrifugal force holds valve in closed position—a completely automatic function.
Valve Closed
DIRECTION OF ROTATION
SLUDGE
LIQUID LEVEL IN BOWL
SLUDGE DISCHARGE
SLUDGE
When flow of liquid is restricted by accumulated sludge in bowl, pressure on valve piston is unequal, forcing valve to remain open by overcoming centrifugal force—automatically the sludge discharges, and valve closes when pressure equalizes as above.
Valve Open

The continuous centrifuge units used for Stearine removal are called Sharples DG-2 Autojectors. This is a disc-type, bowl centrifuge using valves which operate by hydrostatic difference resulting from the gravity difference of the stearine heavy phase and the miscella phase. The valves discharge the stearine automatically as it accumulates along the wall of the bowl. A good way to describe these valves is that they "think for themselves". Regardless of the variations in stearine content in the incoming oil they will discharge the stearine with no adjustment necessary by operators. Operation of automatic valves, one of which is encircled in overall view below, is depicted in cross-sectional diagrams at left.

Unique feature of this centrifuge installation is that the units have run as long as three months without ever shutting them down for bowl cleaning. Several times daily hot oil is introduced to remove any accumulation of stearine or other undesirable solids in the bowl



a U.S. Filter self-cleaning pressure leaf filter.

Resulting polished stearine is pumped either to a continous stearine deodorizer or to a storage tank for shipment.

The winterized oil fraction separated by the Sharples centrifuge goes to another solvent still where hexane is removed.

Winterized oil is heated in a continuous Girdler deodorizer which uses Dowtherm for heat transfer. The hot oil (460° F) passes through a series of trays or compartments where steam removes the odoriferous components.

Before leaving the deodorizer the oil is cooled to 150° F, and then is polish filtered.

Since the desolventized oil comes from the still and goes directly to the deodorizer at about 250°F and is already under 12-16 inches of mercury vacuum, two process steps (heating and deareating the oil prior to deodorization) are eliminated.

Eliminating contact of oil

SUPPLIERS

The Ranchers Cotton Oil miscella refining process is available for use by other refiners under a licensing arrangement. Write directly to Ranchers Cotton Oil Co., P.O. Box 243, Fresno, Calif.

Key equipment other than Continuous Winterizer, which was specially designed and built for Ranchers is listed below:

Homogenizer for miscella and dilute lye is a unit made by Manton-Gaulin Mfg., 59 Garden St., Everett 49, Mass.
6287 on Reader Service Slip.

Pressure leaf filter which replaces secondary wash centrifuge is self-cleaning Hercules Model D-C-D which is equipped with rotating leaves and jet spray sluicing with hexane for self cleaning without opening filter. —— Hercules Filter Corp., 175 Ethel Ave., Hawthorne, N.J.
6288 on Reader Service Slip.

Refining Centrifugal for removal of soapstock is Sharples AS-26P, with tubular separating bowl. Develops centrifugal force 16,000 times that of gravity to squeeze miscella out of oil and increase yield. Both phases are discharged continuously. Bowls are cleaned in place: unit is shut off, valves are adjusted, and hot detergent solution is introduced for short period to clean bowl without dismantling. —— The Sharples Corporation, 2300 Westmoreland St., Philadelphia 40, Penna.
6289 on Reader Service Slip.

Centrifuge for separating oil from stearine is Sharples DG-2 Autojector disc-type bowl centrifuge. Valves discharge stearine at intervals automatically as it accumlates along wall of bowl. Units have run for three months without disassembly shutdown Centrifuges give higher yield of oil than former gravity settling method. Because more stearine is removed, oil readily meets cold test requirements without further refining. —— The Sharples Corp., 2300 Westmoreland St., Philadelphia 40, Pa.
6290 on Reader Service Slip.

Vacuum deodorizer and cooler is a unit made by Girdler Process Equipment Div., Chemetron Corp., Louisville 1, Kentucky.
6291 on Reader Service Slip.

Polish filter for stearine is U.S. Filter Model 100 Auto-Jet Self-Cleaning pressure filter, precoat-slurry tank, pumps, piping and valves mounted on a skid base. The Auto-Jet filter combines powerful spray jets and rotation of the circular leaves to remove the cake dropping it into the V-trough where it is discharged from the filter by means of a screw conveyor. —— U. S. Filter Co., P.O. Box 3014, Los
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It is a good gear and bearing lubricant, even under high pressures. On cutting knives it works well, lasts and lasts.

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producers of ***Myvacet®*** *Distilled Acetylated Monoglycerides*

DPi

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6293 on Reader Service Slip.

with air and light during processing also has desirable effect on stability of finished product.

After discharge from the deodorizer, Vitagen gas (a mixture of inert gases with slight amount of reducing gas) is added. This blankets the oil in the storage tank and prevents oxygen contact with the oil.

The Vitagen process will be described in more detail in a coming issue.

ADVANTAGES:
Product and Yield

Quality of the finished oil is so high that conventional bleaching step has been eliminated.

Average A.O.M. (active oxygen method) analysis is 18-plus hours without added antioxidants. A.O.M. test results for commercial oils range from 13 to 17 hrs on an average.

Oil losses during processing are less by the Ranchers method: 12 lb of oil/ton of seed remains in meat, vs. 39 lb/ton in conventional process.

Finished oil yields average 30 to 50 lb more oil/ton of *seed* than conventional processes. This is due to greater extraction efficiency and lower refining, bleaching, and deodorization losses.

Stearine removal from the the oil is more complete as a result of centrifugal separation, that is, less oil is entrained in the crystalline matrix. Therefore, the iodine value of the stearine is substantially lower making a higher quality product. The iodine value is usually less than 75 and has been as low as 63.

The centrifuge also does a better job of stearine removal from the oil, thereby the oil can meet its cold test with no difficulty.

ADVANTAGES:
Capital, Operation

Initial cost of a miscella refinery is competitive with straight caustic refinery, and 20 to 30% less than a conventional soda ash refinery.

One operator per shift runs the refinery. Before Ranchers established a refinery, one

operator per shift was required for the solvent plant alone, which has now been integrated in the refinery.

Process and product variables are not nearly as critical as in conventional process. Refining in miscella (oil dissolved in hexane solvent) lowers viscosity of solution, makes all pumping, heat exchange, and separating processes more rapid.

Instrumentation is simple. Flow meters at 3 key points (See Flow Sheet) plus one AccuRay density control instrument comprise the principal plant instrumentation. (How the AccuRay is used in the process will be described in detail in a future article.)

No expensive metering equipment is needed. Weak lye solution eliminates need for high accuracy control.

The Ranchers Cotton Oil Co. miscella refining process reduces winterizing time from conventional 3 to 5 days to 1½ to 3 hr, reduces refrigeration requirements, eliminates need for refrigerated rooms for winterizing and for subsequent critical filtering.

It puts plant on straight-through continuous production basis, vs. batch winterizing and filtering in conventional processes.

It eliminates plate-and-frame filter presses and disassembly labor amounting to several man-hours per day.

Since the Ranchers winterizer will tolerate small amounts of moisture, a dehydration step is eliminated.

A bleaching step is also eliminated, as is one heat-exchange step and one vacuumizing step since oil goes directly from solvent still to deodorizer.

The surfaces of heat exchangers, storage tanks, and pipes remain clean for longer periods, with less burn-on and less downtime for cleaning. This means longer production runs at higher efficiencies on heat-exchange surfaces, less friction for pumping, etc.

Solvent recovery equipment is cleaned once per year now, vs. every 4 to 6 weeks when operated on crude miscella.

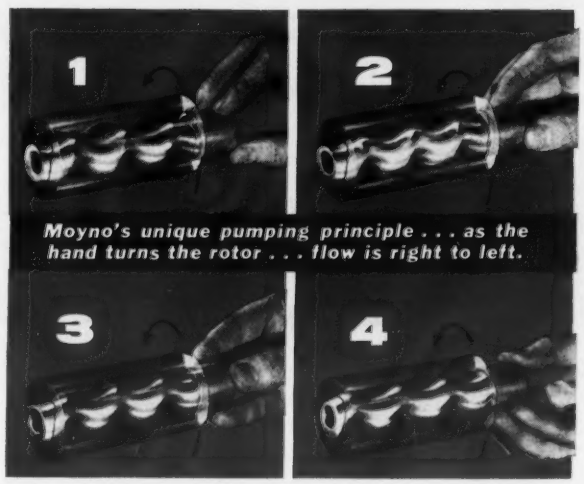
Process is flexible and can be adapted to a variety of vegetable, animal, and fish oils.

END

MOYNO® *solves tough pumping problems!*

Moyno's "progressing cavities" successfully handle thin watery slurries, non-pourable abrasives, gnawing corrosives or suspended solids up to 1⅛" dia.—without crushing, foaming or aerating! Material contacts only one moving part, a screw-like rotor revolving in a double-threaded stator. Where corrosives or abrasives are to be handled, rotor and stator are made of special resistant materials that minimize maintenance and prolong pump life. Many materials now pumped by Moyno were once considered "unpumpable" . . . had run up prohibitive maintenance costs on other type pumps or ruined them completely!

Moyno pumps are available in capacities to 500 gpm; pressures to 1000 psi. Learn more . . . write today for new Bulletin 100-FP!



Moyno's unique pumping principle . . . as the hand turns the rotor . . . flow is right to left.

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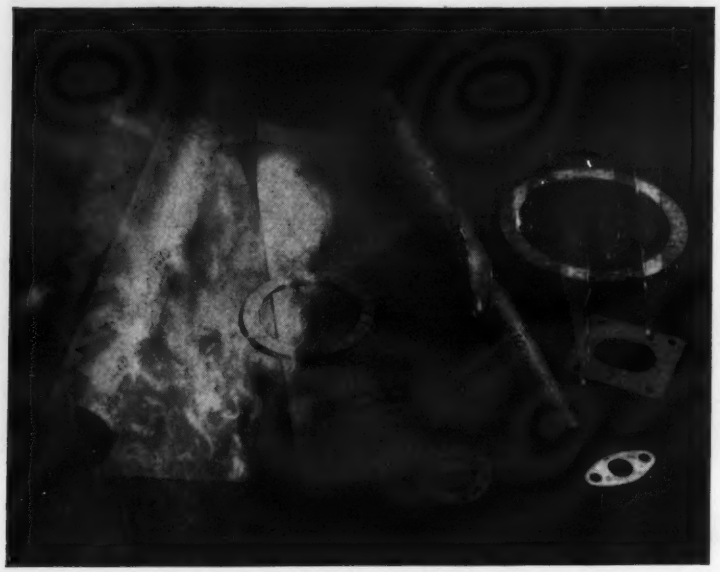
Fractional and Integral HP Electric Motors • Electric Hoists and Overhead Traveling Cranes • Moyno® Industrial Pumps
Propellair® Industrial Fans • R & M-Hunter Fans and Electric Heat • Trade-Wind Range Hoods and Ventilators
Subsidiary companies at: Memphis, Tenn., Pico Rivera, Calif., Brantford, Ontario.

6343 on Reader Service Slip.

GASKETS
for Food
Processing



For tight sealing against high temperature steam and corrosive liquids, specify Garlock gasketing . . . available in either sheet or cut form or special construction.

For all your gasketing needs, choose from a complete line of Garlock materials. Regardless of service conditions, there is a specific Garlock style for the job.

In either sheet form or cut to your specifications, Garlock offers **Style 7021** synthetic binder and long fibre asbestos, superior for hot oil service at 700°F; **Style 7228** high quality neoprene binder and long fibre asbestos, for gasoline, naphtha, benzine and other hazardous liquids and solvents, temperature to 300°F; **Style 7705** synthetic binder with blue African asbestos fibre, excellent against hot and cold mineral acid; **Style 900** long fibre asbestos with synthetic binder, for service against steam, gas, air, temperatures to 700°F; **Style 7772,** long fibre asbestos with synthetic binder, white in color, for service in chemical and petrochemical process equipment where leeching is a problem, temperatures to 700°F. Other gasketing materials available to meet your specific requirements.

In rubber sheet form, Garlock offers Style 7986 Neoprene sheet for flanged joints where oil resistant qualities of neoprene are required; **Style 8495** Buna-N sheet for gasketing against oils and solvents at temperatures up to 300°F; **Style 7992** Neoprene rubber diaphragm sheet for wet natural gas, gasoline, oils at medium or high pressures; **Style 9296** Silicone-Dacron diaphragm sheet for hot or cold air, high aniline point oils and many fire resistant fluids such as cellulube at temperatures up to 300° as cellulube at temperatures to 300°F.

For prompt delivery, complete gasket cutting facilities are available in Palmyra, N. Y., Philadelphia, Pa., Houston, Tex., San Francisco, Calif., and Hamilton, Ontario, Canada. Get details by contacting the nearest of the 26 Garlock sales offices and warehouses throughout the U. S. and Canada. Or, write Garlock Inc., Palmyra, N. Y.

GARLOCK

Canadian Div.: Garlock of Canada Ltd.
Plastics Div.: United States Gasket Co.

Order from the Garlock 2,000 . . . . two thousand different styles of Packings, Gaskets, Seals, Molded and Extruded Rubber, Plastic Products.

6344 on Reader Service Slip.

Temperature and relative humidity determine

candy shelf life

IT IS COMMON knowledge that chocolate covered candies should be stored at 60°F temperature and 50% relative humidity and that under these conditions normal shelf life can be expected. However, it is also true that the same candy stored at 40°F and 50% relative humidity will stand up about five times as long.

The same ratios hold true for caramels and fudges at higher humidities. For example a wrapped caramel stored at 70°F and 60% relative humidity will stay fresh for about two months. At 40° F and 60% relative humidity it should stay fresh for almost a year.

In hard candy we have a peculiar phenomena. Strange as it may seem, if the relative humidity is too low we lose some of our shelf life while temperatures, unless they are extreme, will effect it very little. The optimum relative humidity for hard candy is between 30% and 40%.

If it gets any higher the candy can sweat and become sticky. If it gets too low the difference in vapor pressure between the air and the candy will cause the small amount of internal moisture to migrate to the surface and cause an undesirable surface glaze.

Extremely low humidities also cause dusting of hard candy when the moisture content is very low and this can dull the external surface. Of course, if the hard candy is packed in a sealed container it forms its own atmosphere and if the original moisture content is below 1½% it will stand up almost idefinitely.

The ultimate step in extending the storage life of candy of all classes, with the exception of hard candy is freezing.

Fresh candy, and I mean really fresh candy, when properly prepared and packaged can be held at temperatures between 30° F and −10° F for periods up to two years and when properly defrosted will be as fresh as the day

they were made — but there are several conditions and some peculiar results.

First the package must have a good vapor seal.

Second, the relative humidity of the storage rooms must be held within reasonable limits, not more than 65%.

Third, the chocolate coating should have butter oil in it to take away some of the extreme brittleness that will occur when it is frozen.

And fourth, the candy should be properly defrosted with vapor seal intact and either a corrugated container or paper around it to absorb the condensed moisture that is bound to collect during the defrosting period.

In my own research there was only one candy that did not freeze well and that was a honeycombed chip which had a tendency to crack when it was defrosted.

Cordial cherries and fruits are another exception in that they may develop sugar crystals. If they are frozen before they are liquid, however, they will start to cordialize after defrosting without any danger of crystallization.

I emphasize again that only fresh candy should be used. Fresh frozen candy upon defrosting will start a normal shelf life period and aside from a slight mellowing of the softer pieces, which I personally feel is advantageous, will stand up for the usual shelf life periods starting from the date of defrosting.

Candy which was not fresh when it was frozen but was, for example, six weeks old at the time of freezing will taste fine the day it is defrosted; but then comes the calamity, for it will run downhill with amazing speed in less than a week!

There are several companies today that are successfully extending the shelf life of their product by freezing. Of course, the cost of freezing, and it is costly, must be justified by the savings in production costs, by extended markets, or by an improvement in quality.

(Taken from remarks by Claude D. Barrett, V.P., Pearson Candy Co., Los Angeles, before 1961 Western Candy Conference, Santa Barbara, Calif., February 23.) END

POWELL PERFORMANCE PAYS OFF

Powell valve performance really pays off for the chemical industry. Take "reliability" for instance.

Powell reliability starts with good design features specifically tailored for chemical installations. For example, there is a deep stuffing box for an extra amount of special packing. And valve bodies are designed with full flow areas for maximum flow conditions and minimized pressure drop. Also, wedge discs are precision machined and fully guided to eliminate drag and wear of the seating surface as well as undue vibration.

You get thorough valve engineering like this—plus, industry's widest selection of valve materials, both ferrous and non-ferrous, so that Powell valves can withstand virtually any problem of corrosion, erosion, temperature or pressure. Whatever your valve requirements—look to Powell.

All this adds up to reliability that gives a performance pay off to you. Get the full story from your nearby Powell Valve distributor, or write The Wm. Powell Company, Cincinnati 22, Ohio.

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THE WM. POWELL COMPANY CINCINNATI 22, OHIO

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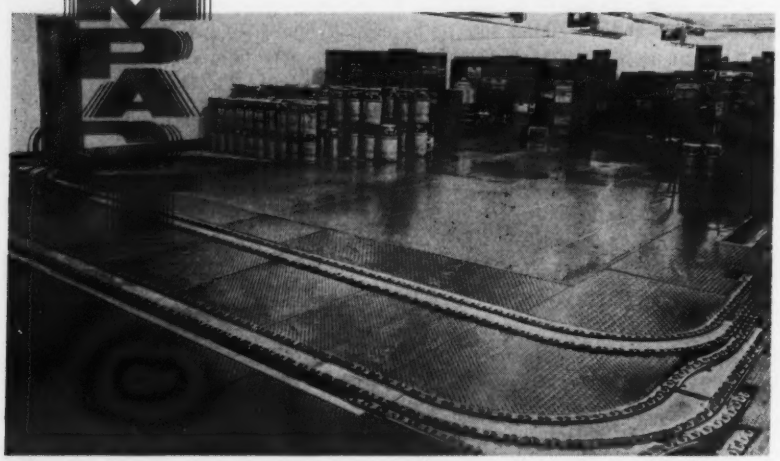
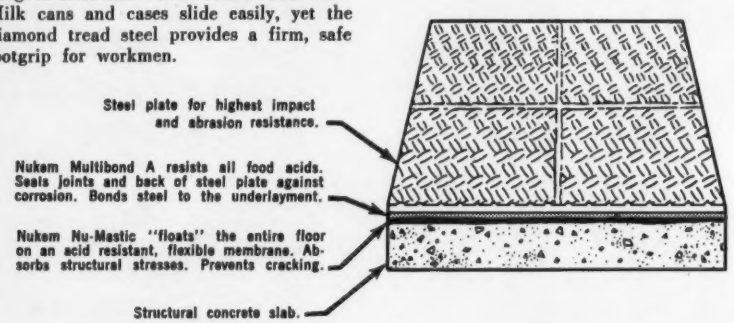
Nukem

STEEL PLATE FLOORS can take it!



This Nukem steel plate floor is structurally strong to withstand severe impact of full milk cans as well as constant structural movement that results from temperature changes. Since it is laid in chemical-proof Nukem Multi-Bond cement, this floor will never corrode, will not allow bacteria or fungi to form and will be forever odor-free! Milk cans and cases slide easily, yet the diamond tread steel provides a firm, safe footgrip for workmen.

Nukem steel plate floors give trouble-free service, year after year after year. Nukem pioneered this type of floor and continues to produce the most dependable construction materials.


Steel plate for highest impact and abrasion resistance.
Nukem Multibond A resists all food acids. Seals joints and back of steel plate against corrosion. Bonds steel to the underlayment.
Nukem Nu-Mastic "floats" the entire floor on an acid resistant, flexible membrane. Absorbs structural stresses. Prevents cracking.
Structural concrete slab.

Your industry—your plant—has its own individual operating conditions which may be absolutely unique. Whatever your problem, Nukem can design a floor to provide the best possible protection.

Service is not confined to milk plants. Whether you need a steel plate floor . . . an acid-proof brick or tile floor . . . Nukem can engineer it and supply the proper construction materials.

Your Nukem floor will be the most satisfactory installation you can buy for years of maintenance-free service! Write today for technical data.

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High-speed liquefier

helps developed more efficient process for production of sour cream from frozen cream

BY REPLACING what was formerly a batch process with a semi-continuous process for producing sour cream,* and adding only one piece of equipment — a high-speed liquefier for frozen cream — Middletown Milk and Cream Co. has achieved the following results in their Fraser, N.Y., plant:

1. They have doubled the rate of sour cream production. The equipment is therefore available for use in other processes including production of condensed and powdered milk, ice cream mix, buttermilk and cottage cheese, as well as the processing of raw milk and cream.

2. They have reduced labor costs. Formerly two men were required to produce 120 cans per eight-hour shift, and additional labor was necessary for cleanup. Now, three men produce 250 cans per eight-hour shift, with no additional labor for cleanup.

3. They have reduced quality control costs. Formerly 10 batches of sour cream (each 250 gallons) had to be tested for butterfat, etc. Now an entire day's production of 2500 gallons, produced semi-continuously, can be tested at one time.

4. They have improved quality control. Variations in fat content were formerly held to plus or minus 0.5 percent. Variations with the new system are held to plus or minus 0.02 per cent, resulting in a direct saving in cream costs of upwards of $15 per day.

5. They are producing a higher-quality, more uniform product with closer control of bacteria, of non-fat solids, and of homogenization.

6. They are preventing damage to equipment formerly caused by the presence of lumps of still-frozen cream.

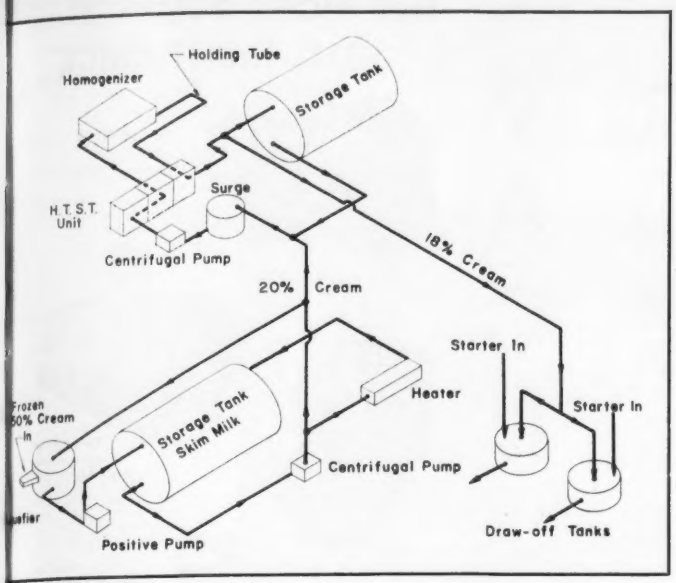
Details of the process are given in the flow diagram and text on facing page.

*Note: Sour cream sales have been increasing rapidly all over the country, sparked by dairy association advertising and imaginative marketing of the product under the names "salad cream" and "Devonshire-type" sour cream to ethnic groups that do not traditionally use it.

Frozen cream is emptied onto the loading chute of the Bryant Liquefier. Rotating, steam-heated disc melts cream, slings it into collector ring for transfer to storage tank immediately behind Liquefier. The Bryant Liquefier is the only single new piece of equipment in the revamped production line; it is manufactured and marketed by S. Blickman, Inc., Weehawken, N.J.

Up to 3000 lbs per hour of 50 per cent frozen cream can be melted for use in sour cream as well as in the production of cream cheese, butter, egg nog mix, and ice cream mix. The speedy uniform liquefying of the cream in the unit reduces oiling-off and subsequent destabilization after homogenization. The Liquefier has also been found highly effective for liquefying frozen eggs for bakeries and salad dressing manufacturers.

6347 on Reader Service Slip.



Steps in the new semi-continuous sour cream process

Much of this process represents a completely new way of producing sour cream. The inventors, Ben Jaffe and Marvin Silverman, chief engineer and director of quality control, respectively, for Middletown Milk and Cream Co., have been issued a patent on it for which licensing arrangements are available.

A. The night before, one day's consumption of 50 per cent frozen cream (90 tins) is placed under an ordinary room heater to loosen the cream in the cans. In the morning, 1350 gal. of skim milk is placed in a storage tank. (This is enough skim milk to produce a 20 per cent fat content when mixed with 50 per cent cream.)

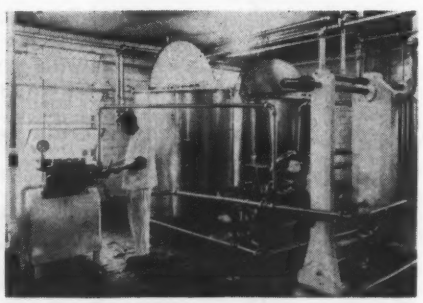
B. Frozen cream is emptied onto the loading chute of the Bryant liquefier, from which it slips onto the equipment's spinning, steam-heated disc, is melted swiftly, and spun against the sides of the unit, from which it runs down into a collecting trough.

C. Meantime, the skim milk is pumped to a plate-type heat exchanger, raised to 120-140°F, and pumped into the liquefier.

D. The cream-milk mixture is returned to the storage tank, and recirculated through the heat exchanger and liquefier until all the frozen cream is melted and mixed with skim milk. Recovery of the frozen cream is almost 100 per cent. The loading chute of the liquefier is given a quick steam rinse to remove any cream deposited on it, and circulation of the skim milk through the liquefier acts as a further rinse.

E. The cream is pumped to the floor above for pasteurizing (HTST) at 160° and delivered to the homogenizer for 2-step homogenizing at 500 psi, then 1,500 psi. While it is being pasteurized and homogenized, butterfat content is determined for the entire run.

F. Skim milk is added at the end of the run to bring fat content down to 18 per cent. From here, the cream is pasteurized and homogenized again, cooled to 74° F., and made into sour cream by: 1) the addition of starter and rennet with agitation; 2) then it is drawn off and incubated at 78° F. in 10-gallon cans until it reaches an acidity of 60 (titrated with 1/10 normal sodium hydroxide); 3) and finally is cooled to 33-37° F. and aged for 48 hours. END



Operator adjusts homogenizer which is used twice during semi-continuous process, once at 2000 psi, again at 2500 psi. Plate-type heat exchanger at right is used for high-temperature short-time pasteurizing in-line with each homogenization, then for cooling cream en route to draw-off tanks

Revolutionary Principle of DAY NAUTA MIXER*

Assures
HIGHEST Mixing Accuracy
in SHORTEST Mixing Time

Compare these Unequalled Features:

• **HIGHEST MIXING ACCURACY** — Consistently superior performance in plants here and abroad prove the Day Nauta Mixer produces a greater degree of mixing accuracy in less time than any other known type of equipment.

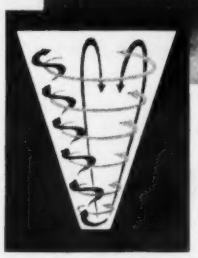
• **LOWEST MIXING TIME**—Obtain a thorough mix in ½ to ⅓ the time of conventional mixers.

• **EASY ADDITION OF LIQUIDS** — Day "Microjet" device permits easy additions of molasses, fats, oils, vitamins, etc., to large amounts of batch. Insures complete homogeneity of mix and no lump formation.

• **STARTS UNDER FULL LOAD** — Mixing starts under full load as unique three-way mixing action immediately loosens the batch; prevents stalling.

• **LOW POWER CONSUMPTION**—A 5 hp. motor can mix a 4000 lb. load.

• **SANITARY DESIGN** — Continuous cone shape of container eliminates corners and crevices. The Day Nauta is quick and easy to clean.



NEW
THREE-WAY MIXING ACTION!

Three distinctive mixing actions (see diagram) give a quick, accurate mix. Batch is mixed and spiraled upward by mixing screw. At same time, screw orbits around inside wall of conical container, moving batch in a large, second spiral. Third action is a gravity action as material flows downward in central area of cone. All three actions converge at the bottom of the cone for a fast, intensive mix, with heat from friction practically eliminated.

The Day Nauta Mixer is built in a wide range of capacities to suit your requirements.

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Practical guide for reducing third-largest cost

Single-command method replacing dual authority

Cost of physical distribution — moving goods from production line to customer's plants and warehouses — is widely regarded today as the third-largest cost of doing business.

As a result, many managements are questioning the traditional "organizational" approach, which divides responsibility for this function between marketing and manufacturing.

Some alert companies now are thinking and acting in terms of *total* distribution costs, and combining and integrating under single command such previously separate physical-distribution functions as order handling, inventory control, shipping, loading, traffic, receiving, warehousing and material handling.

In recently published 200-page report on two special conferences held in fall 1959 and spring 1960, distribution managers describe how their companies have cut distribution costs through reorganizing and integrating this function.

While all phases of distribution management are discussed, special attention (75 pages) is devoted to current transportation developments — "piggybacking," containerization and coordinated transportation.

From the food field, Ross E. Jones, vice president — distribution of H. J. Heinz Company, explains functions and practices of physical-distribution management. W. H. Gribble, director of distribution, The Pillsbury Co., describes function of physical-distribution management in Pillsbury's Grocery Products Division.

AMA Management Report No. 49 — "Management of the Physical-Distribution Function" — is available to AMA members at $3.50, non-members at $5.25 from Manufacturing Division, American Management Assn., Inc., 1515 Broadway, Times Sq., New York 36, N.Y.

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plants, companies, personalities

Corn Products Company

announces election to its board of directors of Ezra Taft Benson, Secretary of Agriculture throughout the Eisenhower administration.

Singleton Packing Corporation

Tampa, announces entry into the processed shrimp field with completion of a 10,000-sq-ft plant in Tampa, having a 25,000-lb packaged shrimp output daily. John Duggan has been appointed general manager of plant operations.

The Borden Company

announces promotion of Edward T. Keneally to vice president in charge of production for its Western Division, headquartered in San Francisco. Borden also announces imminent completion of a $900,000 packaging plant in Mallow, County Cork, Ireland — the company's third European dry milk facility, and a completed $245,000 expansion at the Grafton, N.D., potato flake processing plant, providing doubled production and storage facilities.

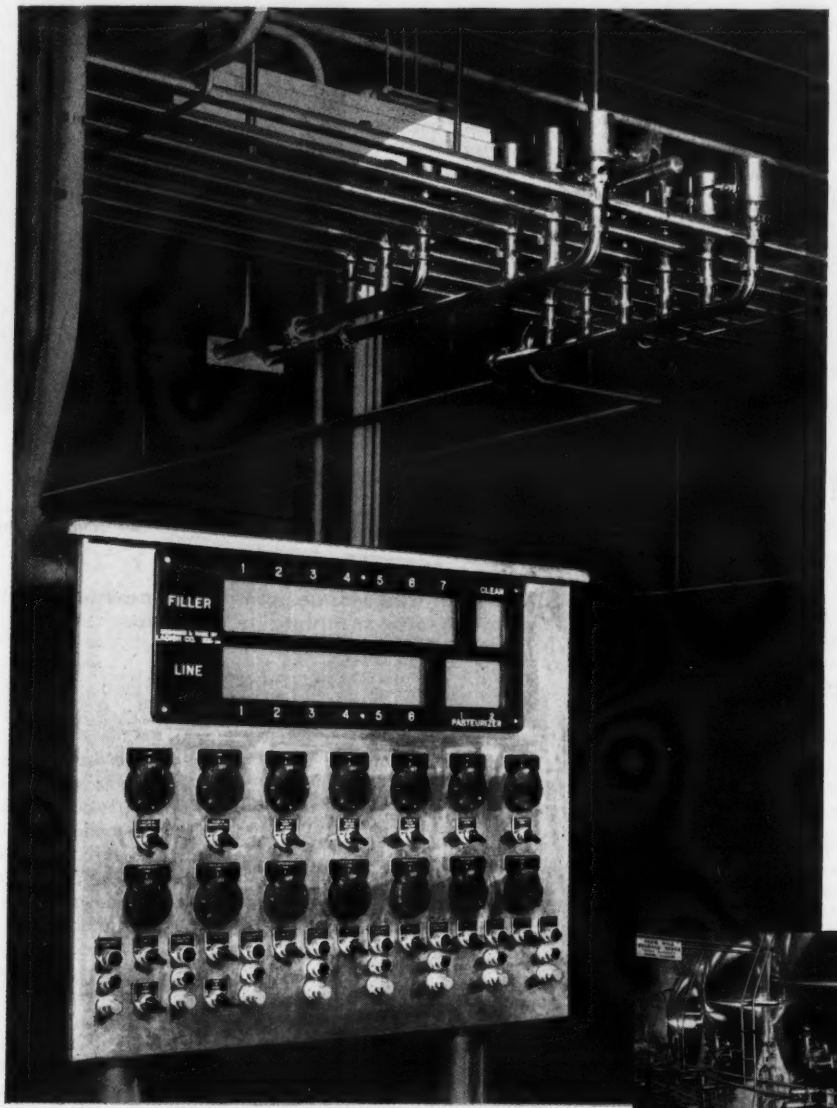
Thomas J. Lipton, Inc.

has promoted John N. Byrne from plant manager of its Suffolk, Va., tea processing and packaging plant to director of engineering for the company. He will report to Robert B. Law, vice president-manufacturing. Lipton also announces two research appointments: Dr. John Joseph Kagan, recently with the University of Toronto, to group leader on carbohydrate research in the Chemical Research Section; James H. Moy, recently a chemical engineer with Esso Research and Engineering, to a staff position concentrating on the study of food dehydration.

For more information on product at right, circle 6353 see information request blank opposite last page.

TRI-CLOVER EQUIPMENT

sets new standards in automatic processing at new Borden plant



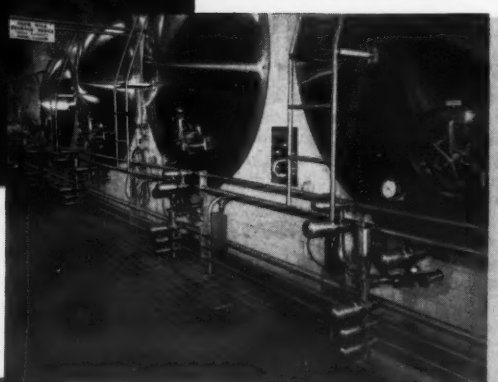
Control center above automatically controls the flow of milk to fillers. Panel has a projection type digital display unit which shows at a glance exact status of filling operation.

Ladish Co. is proud of the important part played by its Tri-Clover and Fesco Divisions in helping The Borden Co. achieve new standards of efficiency in the modern, automatic processing operations of their new "*Dairyland Showcase*" plant in Milwaukee, Wisconsin.

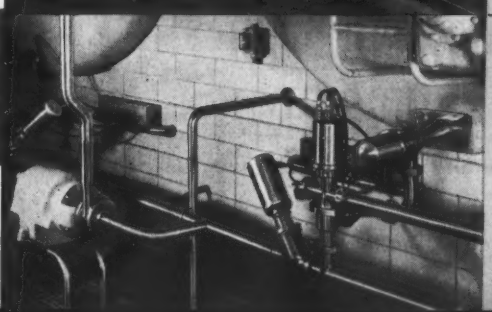
Designed, manufactured and installed by Ladish Co., Tri-Clover and Fesco Divisions, equipment to process up to 500,000 quarts of milk per day includes 152 "FESCO" air-actuated valves . . . modern control panels . . . hundreds of "Tri-Weld" stainless steel welding fittings, welded in place with a "Tri-Welder" automatic welding machine right in the plant . . . numerous Tri-Clover sanitary centrifugal pumps . . . special pipe hangers and supports . . . as well as almost 7,000 feet of stainless steel tubing "Tri-Welded" on the job.

The combined engineering ability, design and manufacturing skill of these Ladish Co. Divisions has helped to lead the way to modern automated dairy plant operation. Let this wealth of experience serve you in your next expansion program.

Write for further information or see your nearest ***TRI-CLOVER DISTRIBUTOR.***



Group of milk storage tanks having a combined capacity of 70,000 gallons, each of which utilizes seven "Fesco" valves for distribution and CIP operations.



Valve manifold for filling storage tanks and transferring milk from tanks to filling machines. Tri-Clover pumps are easily removed from lines for inspection and maintenance.

TRI-CLOVER

LADISH CO.

Tri-Clover Division
Kenosha Wisconsin

S161

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AO's Goldberg Process Refractometer Prevents Waste ... Increases Profits

This in-stream Refractometer can be mounted in wall of process vessel, evaporator, vacuum pan, product pipe line or other location where continuous reading is desirable. Quickly determines total soluble solids in turbid and dark-colored concentrates such as jellies, jams, purees, juices and syrups.

1 **Prevents profit loss:** Determines exact endpoint of cooking batch by providing continuous, in-process readings of total solids. Prevents profit loss due to soluble solids "give away" by over concentration.

2 **Prevents product waste:** In-process readings on *hot* product eliminates old-fashioned external sampling with its consequent product waste and time loss. Savings in product alone, in most cases, will pay for the instrument in one season.

3 **Prevents errors:** Since product is always tested in-process, errors due to evaporation, temperature changes or opacity are eliminated. Readings are not affected by viscosity, foam, air bubbles or pulp and there's no need to correct for temperature differences between refractometer and process vessel. Accurate readings can be taken by anyone...no skilled technicians required.

4 **Three Brix ranges available:** 0-25%; 12-72%; 36-82% total soluble solids. Withstands pressure of 40 lbs. and temperatures ranging up to 250°F.

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INSTRUMENT DIVISION, BUFFALO 15, NEW YORK

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400-gal lard-treatment tank is at left, filter in center and spare cartridge, clean and ready for insertion, at right. In filter, cartridge is located immediately above a patented scavenger plate, a feature that helps recovery of practically last drop of fat.

In background are two rectangular, 20,000-gal storage tanks, one of which is used for storing fat as it comes from cookers, the other for storing treated lard.

Fat is pumped from first storage tank to treatment tank where it is mixed with filter aid and adsorbent. It is then pumped through filter and into finished storage tank.

For precoating, first batch through filter is recirculated back to mixing tank for five minutes before going to finished storage tank. Subsequent batches are filtered directly

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Johns-Manville Sales Corporation

PROBLEM: When Sioux City Dressed Pork Company started up its new plant in Sioux City, Iowa, fat refining consisted only of filtering. After rendering, filter aid was added to fat and mixture pumped through a filter.

Method resulted in a product that often did not meet trading standards of lard — color, FFA and MIU. While clarity was good, finished product frequently had a Lovibond (red) color above 3.0 and therefore had to be classified as "pork fat" instead of "lard" with accompanying losses in sales value.

Since total yield of lard is about 24,000 lb/day, loss of ¼¢/lb or more due to degrading of fat could amount to $60 per day.

Operation of new plant is confined to producing pork products. Fats from killing and cutting floors are rendered in dry cookers, operating under pressure.

Solution: After a series of tests using a synthetic, hydrated magnesium powder to adsorb impurities, the following procedure was set up as standard.

Four pounds of the adsorbent, Celkate T-21, are added to each 4000-lb batch of fat, and contacted for a time of 15 to 30 min at 175 F. Equal amount of Celite 503, a diatomaceous filter aid, is also added to each batch.

Filter used is a Sparkler 18-S-23 horizontal plate filter with scavenger plate, see photo above. Filter is designed for free drainage of effluent. That is, perforated screen plates and filter plates are arranged to provide unobstructed flow of filtrate to outlet ports.

Results: Since use of adsorbent, not a single carload of fat has failed to qualify as lard. Most Lovibond (red) readings have ranged from 1.0 to 1.5 — considerably below allowable maximum.

Powder not only adsorbs undesirable colloidal impurities to decolorize, but also adsorbs objectionable flavor components to make lard blander.

Celkate T-21 and Celite 503 are products of the Celite Division of Johns-Manville Corporation, 22 East 40th St, New York 16, N.Y.

6355 on Reader Service Slip.

Sparkler filter is a product of Sparkler Manufacturing Co., Conroe, Texas.

6356 on Reader Service Slip.

Short on refrigeration?

Booster compressors may be your answer

Rising condensing temperatures as a result of hot weather, or purposely lowering suction pressures to obtain lower temperatures, will increase compression ratio and will in turn decrease refrigeration capacity of the compressor.

Detailed, technical — but readily understandable — explanation of what occurs in the refrigeration cycle and what can be done to increase its capacity is presented in a four-page brochure, Refrigeration Compressors in the Frozen Food Industry, available from Freezing Equipment Sales, Inc.

In this brochure it is demonstrated why rotary compressors are ideally suited to act as boosters for obtaining lower refrigeration temperatures. These rotary compressors, as well as high- and low-speed reciprocating compressors and centrifugal compressors are illustrated and discussed in detail.

Literature points out pertinent features of the machines and their principles of operation.

Two charts which are included compare the three types of compressors with respect to capacity and power requirements. There is also a simplified flow diagram which shows one method of using all three types of compressors in one refrigeration system.

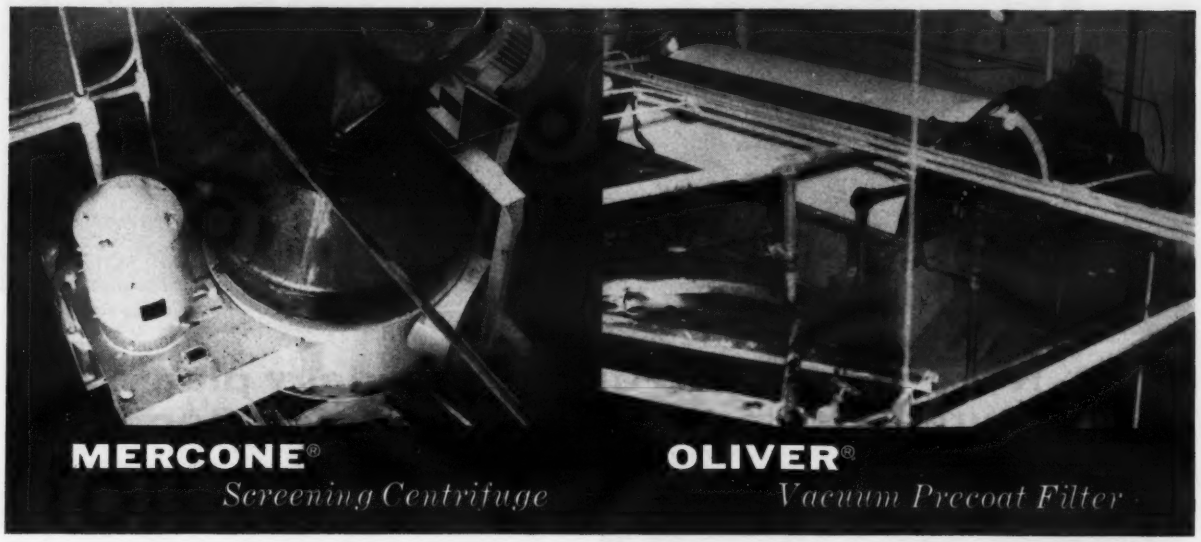
6357 on Reader Service Slip.

Complete line of scales for the meat industry

Full line of scales for the meat packing industry — from over-and-under scales to 1000-lb capacity mobile scales — is presented in 58-page, spiral-bound brochure, released by The Exact Weight Scale Co.

First section of publication deals with precision, high-speed over-and-under scales.

MODERN APPLE JUICE PROCESSING COMBINATION *cuts time... scores new highs in juice flavor!*



Continuous, automatic processing, instead of the traditional batch methods, now makes possible simplified, low cost production of clarified, full flavored apple juice. Key to successful operation is the combination of a Mercone Screening Centrifuge and an Oliver Vacuum Precoat Filter, shown above.

The Mercone Screening Centrifuge is a compact, completely enclosed stainless steel unit that provides instantaneous separation of pomace and juice by centrifugal action. Messy filter blankets are done away with as well as the manual labor involved with conventional presses.

Clarification of Mercone extracted juice is accomplished on the Oliver Precoat Filter, which presents to the fresh juice a clean precoat surface each revolution, for continuous removal of the extremely fine solids.

Processing from apples to clarified juice is done in minutes — eliminating losses of flavor and aroma.

Leading processors now using these units include the Duffy-Mott Company, manufacturers of Mott's Apple Juice, and the Sebastopol Cooperative Cannery of California.

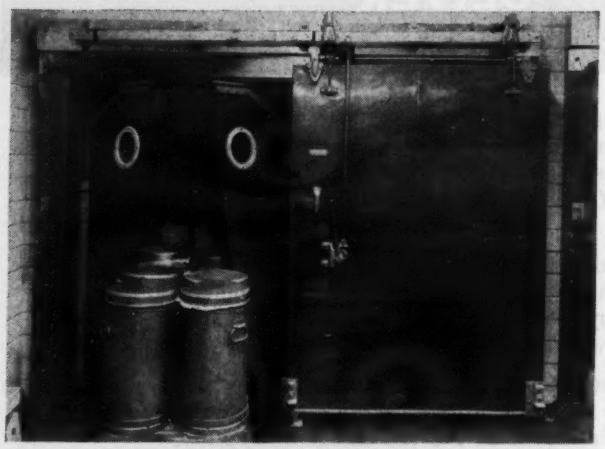
For more information on application to your juice extraction problems, write Dorr-Oliver Incorporated, Stamford, Connecticut.

DORR-OLIVER
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

6358 on Reader Service Slip.

FAST OPENING AND CLOSING. Jamison Electroglide® Power Doors speed traffic to loading dock—single leaf cooler door, left, and bi-parting freezer door, right.

New $3,000,000 automated dairy plant features Jamison Horizontal Sliding Doors



SAVES REFRIGERATION. Jamison Manual Horizontal Sliding Door in combination with self-closing Flexidor®.

RAPID, CONVENIENT LOADING. Jamison Manual Horizontal Sliding doors facilitate loading of dairy products.

• In a dramatic advance toward automated processing of fluid milk and ice cream products, the Borden Company recently completed a new $3,000,000 plant at Milwaukee, Wisconsin. An important feature of this modern plant is a number of Jamison Horizontal Sliding Cold Storage Doors.

More and more, in the design of new, modern facilities like this one, Jamison Doors are specified to save space, minimize refrigeration loss, speed traffic and facilitate handling of products and materials. Get the story of the cost-saving benefits of Jamison Doors from your architect, or write to Jamison Cold Storage Door Co., Hagerstown, Md.

JAMISON
COLD STORAGE DOORS

6359 on Reader Service Slip.

It contains photos, specifications and descriptions of numerous models of these scales for use on packaging lines, stuffing tables etc. Several plant photos are included which show the scales in use.

Brochure similarly presents various models of portion-control and check-weighing scales, models of general-purpose scales, as well as heavy-duty, bench and mobile scales.

An eight-page section discusses features and presents illustrations of line of Shadograph scales. Photos as well as a case history of an automatic checkweigher are also included. Finally there are sections on new line of fan-dial scales and weight machines for semi-automatic packaging, batching and compounding.

Publication contains tables which show what weighing errors can cost in dollars and cents, and a general table of weights and measures.

6360 on Reader Service Slip.

Automation for the dairy industry

Eight simplified flow diagrams which show methods of automating dairy processes are featured in 24-page brochure, available from Cherry-Burrell Corporation. Entitled Mechanization — Automation — Systems, publication has an introduction which clearly defines these terms.

Literature then presents eight flow diagrams of various dairy processes, together with photos of associated equipment: raw-product handling of fluid milk; processing system and packaged-product handling of fluid milk; CIP systems for fluid milk and for ice cream; batch mixing for ice cream and ice-cream mix processing; and package-handling systems for ice cream.

Another section of literature describes and presents illustrations of high-capacity equipments such as 1050 gal/hr freezer, 7500 gal/hr homogenizer and 60,000 lb/hr plate heat exchanger. Final section presents other equipment for processing and control.

6361 on Reader Service Slip.

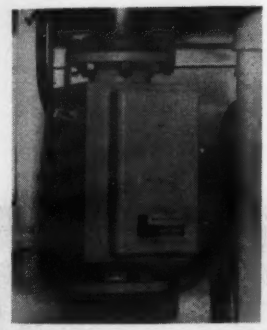
Measures and controls density of liquids without contact

Radiation gage measures specific gravity to 0.001

Uses: For continuous density measurement and control of pumpable liquids and slurries.

Features: Combination of improved gage geometry and increased detector efficiency provides a large output signal that is highly sensitive to changes in specific gravity. Measurement to 0.001 is attainable, depending upon pipe and product variables.

Stability — 24-hour zero shift — of instrument is less



Liquid density-gage head in 5-in. process pipe

than 0.1 per cent of recorder indication, non-accumulative. Standard response time is five seconds.

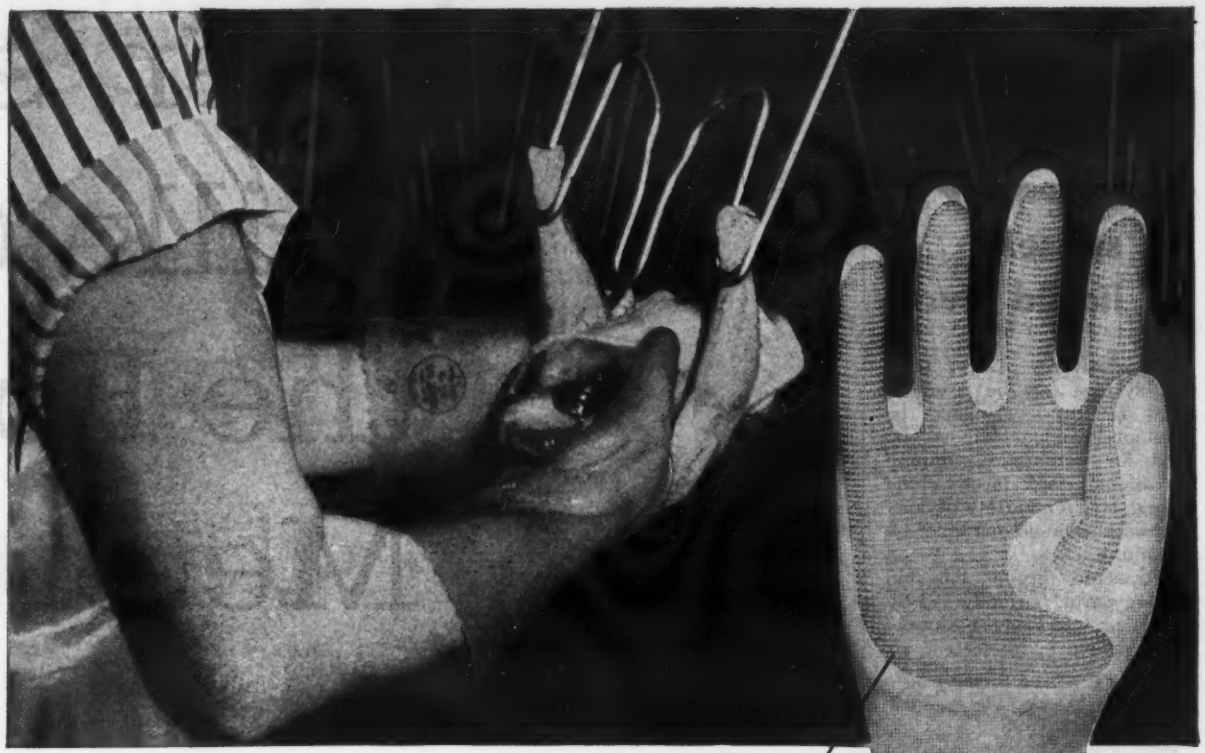
Description: Liquid density gage, Qualicon Model 504, uses gamma-ray transmission which produces an output signal (count rate). Signal is an inverse function of density of material flowing through pipe.

Instrument system has three basic components: measuring head, electronic read-out and recorder-controller. Panel meter for readout is calibrated directly in customer's unit of measurement.

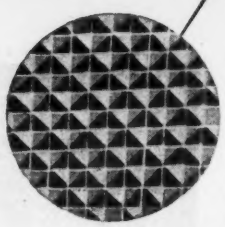
Gage head is made for pipes from three to eight in. in diameter. One-piece Meehanite (cast iron) casting integrates gamma source, process pipe and detector chamber into single, sealed unit.

Supplier: Nuclear-Chicago Corporation, 359 E. Howard Ave., Des Plaines, Ill.

6409 on Reader Service Slip.



no slip with the Non-Slip Grip



WIL-GRIP FIRMHOLD FINISH

MAKES A SURER HAND . . . A FASTER HAND

Wilson® "Long Service" Latex Gloves with the Wil-Grip Firmhold finish molded into fingers and palms provide a sure grip in handling dry or wet and slippery foodstuffs. . . . Exclusive tempering process gives pure latex more resistance to snags and abrasions. . . . Long cuffs can turn up to catch liquids. . . . Available in smooth finish (style LS-154) when greater touch sensitivity is essential.

SPECIAL PROBLEM?

Wil-Gard White Neoprene Gloves extra-resistant to fatty acids, oils, animal fats, many acids and chemicals.

SOLD ONLY THROUGH DISTRIBUTORS

Write today for Wilson Catalog or contact your distributor.

"Long-Service," "Wilson," "Wil-Gard," "Wil-Grip" are Trademarks of The Wilson Rubber Co.

WIL-GARD

WR-760-22

PROTECTION FOR THE HANDS OF INDUSTRY • SINCE 1916

WIL-GARD®

THE WILSON RUBBER COMPANY INDUSTRIAL DIVISION CANTON 6, OHIO

A Division of Becton, Dickinson and Company • Pacific Coast Warehouse: 530 Howard St., San Francisco 5, California

6362 on Reader Service Slip.

Simple, versatile level control . . .

Ultrasonicly senses liquid levels

Uses-Features: Level control system can be used as high- or low-level alarm or constant-level control; can be used for automatic pumping operations, tank-farm monitoring, and for variety of centralized, solenoid-valve programming.

Ultrasonic probe has no moving parts; is unaffected by variations in density, temperature, pressure, dielectric or

Probe is hermetically sealed; controller can be remotely located

conductivity. Probe's sensitive surface is actuated instantly when touched by liquid. It is unaffected by film, droplets or scale build-up.

Control system is stated to have repeatability within thousandths of an inch.

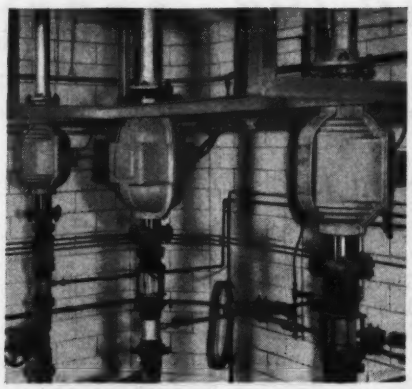
Operation: Probe mounted in liquid reservoirs senses presence or absence of liquid. It actuates controller when medium surrounding probe surface changes from liquid-to-air or from air-to-liquid.

Sensitive probe surface vibrates at an ultrasonic frequency of 40 KC/min (inaudible) when exposed to air. The instant probe surface is dampened by liquid, it will stop oscillations in controller and energize a relay.

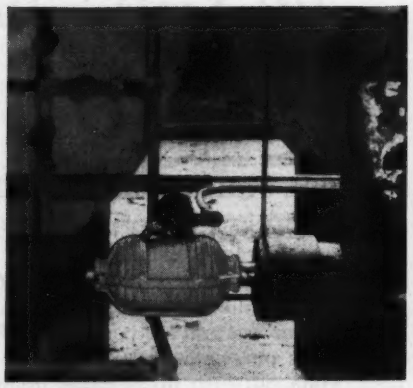
Ultrasonic controller is adjusted so that system operates only in presence of true liquid and is not adversely affected by froth or foam.

Description: Basic Sono-

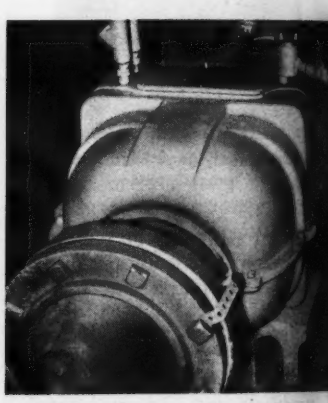
beer, starch m
milk, coffee w
the Foxboro M
Meter hande s



Miller Brewing Company
uses Foxboro Magnetic Flow Meters to provide precise, automatic control of their flow to filters. Since Magnetic Meters have no flow restrictions of any type, they are cleaned "in place" by sending cleaners and ball brushers right through the line.



International Salt Co.
uses 6 Foxboro Magnetic Meters to measure 220° salt brine discharged from filters of Recrystallizer Process. Meters have corrosion-proof liners — give linear measurement, with an accuracy of ±1% of range across the entire scale. Meters are installed outdoors — need no protective housing.

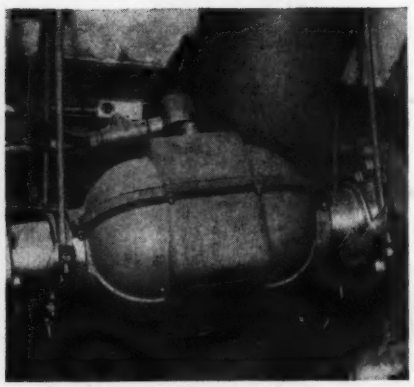


Winebrenner Cannery
cut its town sewage tax by installing this 8 in. Foxboro Magnetic Flow Meter in effluent line. Town used to bill on basis of water consumption — now bills on flow meter readings. In canning season, when much water is shipped out with their products, savings are considerable.

Ralston
uses a Te
Meter to
feeds. Flow
by Foxboro
shown abo
provides i
rate, as we
24-hour op

molasses, juices, wastes... Magnetic Flow does them all

Ralston-Purina Company uses a Teflon-lined Foxboro Magnetic Meter to meter molasses into animal feeds. Flow rate is accurately controlled by Foxboro Dynalog Recorder-Controller shown above. Dynalog* instrument also provides instantaneous reading of flow rate, as well as a chart record of each 24-hour operation. **Reg. U. S. Pat. Off.*



Anheuser-Busch, Inc. Corn Products Dept. installed Foxboro Magnetic Meters to meter starch slurry direct from storage to converter. Measurement is made by electrodes flush-mounted in meter wall. Meter accuracy is unaffected by changes in slurry density, temperature, pressure, viscosity or chemical composition.

Write for Bulletin 20-14

The Foxboro Company,

924 Neponset Ave.

Foxboro, Mass.

FOXBORO
REG. U. S. PAT. OFF.

6363 on Reader Service Slip.

switch sensing system consists only of ultrasonic probe and ultrasonic controller. Latter has a transistorized oscillator and a switching relay. Variety of probes with respective controllers are available.

System is designed to fail safe should probe cable become open or short-circuit, or should a power failure occur.

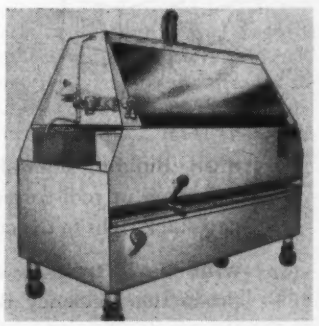
Supplier: Powertron Ultrasonics Corporation, Patterson Place, Roosevelt Field, Garden City, Long Island, N.Y.

6364 on Reader Service Slip.

Automatically greases up to 5-pan straps of bread pans

Use-Features: Designed for continuous service in mass-production bakeries, unit greases full set of bread pans in three, four or five-pan straps.

Multi-pan greaser deposits oil inside each pan simultaneously with spinning-disc applicators. Applicators are synchronized with pan travel to completely cover pans with



Multi-pan grease has smooth-plate construction for easy cleaning

uniform grease pattern. Pan oil is metered into each pan under accurate control.

Description: Model 600 Multi-Pan Greaser has an enlarged tank reservoir which holds 55 gal of pan oil. It has multiple-chain conveyor for smooth flow of pan straps and heavy construction to absorb shock and vibration.

Supplier: Mallet & Company, Inc., PO Box 474, Carnegie, Pa.

6365 on Reader Service Slip.

Making case History
new Butler Buildings

HIGH—Building sidewalls are up to 24 feet high. There are no roof trusses to get in the way. You can stack right to the ceiling.

WIDE—Clear spans, up to 120 feet wide increase production efficiency. Result . . . you get straight line production—faster production flow.

HANDSOME—Best dressed pre-engineered buildings ever. New prestige look. New profiles. New wall systems, never before seen. New colors. New trim. New beauty.

EFFICIENT—Steel structurals carry entire building weight. So you can place loading doors, as many as you like, where they're wanted and needed. No expensive reinforcing necessary.

ECONOMICAL—Butler buildings go up weeks, even months faster. Save construction cost. Get you into business sooner. Lower insurance cost. Lower maintenance cost. Longer lasting. It's the lowest-cost way to build well.

Interested? Phone your Butler Builder for the full story. He's listed in the Yellow Pages under "Buildings" or "Steel Buildings." Ask about financing, too. Or write direct.

CELEBRATING 60 YEARS BUTLER FABRICATING METALS

BUTLER MANUFACTURING COMPANY

7479 EAST 13TH STREET, KANSAS CITY 26, MISSOURI

Manufacturers of Metal Buildings • Plastic Panels • Equipment for Farming, Transportation, Bulk Storage, Outdoor Advertising • Contract Manufacturing

Sales Offices in Los Angeles and Richmond, Calif. • Houston, Tex. • Birmingham, Ala. • Kansas City, Mo. • Minneapolis, Minn. • Chicago, Ill. Detroit, Mich. • Cleveland, Ohio • New York City and Syracuse, N. Y. • Washington, D. C. • Burlington, Ontario, Canada

6366 on Reader Service Slip.

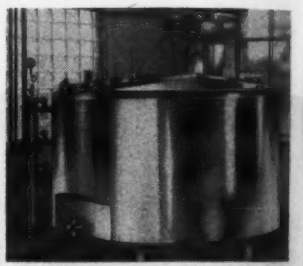
Maintains high quality of Trappist Cheese with—

Six-stage cheese-processing vat

To modernize processing of their famed, Old-World Gethsemani Trappist Cheese, Monks of the Abbey of Gethsemani, Trappist, Ky., installed a specially designed 1000-gal vat.

Since the distinct flavor and texture of the semi-soft, ring-ripened dessert cheese had achieved widespread distinction, both in the US and abroad, it was of primary importance to retain its quality.

In the new vat, made by Mojonnier Bros. Co., 4601 W. Ohio St., Chicago, Ill., six process steps take place: pasteurization, cooling, inoculation, incubation, cutting and cheese cooking.



Temperature in 1000-gal, SS cheese-processing vat is controlled by zones from bottom to top

Cheese is cut with special knives, and heat for cooking is supplied by steam, flowing through vat's waterways.

After processing, cheese is cured in humidity- and temperature-controlled, insulated cellar. Final production step consists of packaging cheese in one- and three-pound wheels for shipment.

6367 on Reader Service Slip.

Controlled atomization up to 60,000 lb/hr

Spray machines capable of handling up to 60,000 lb/hr easily maintain constant feed rate since material feedings depends on simple gravity

flow or low-pressure pumping. These spray machines and their centrifugal atomizer wheels are the subject of four-page Bulletin 51, now available from Bowen Engineering Inc.

Entitled The Bowen Spray Machine and Centrifugal Atomizer Wheels . . . Engineered for Controlled Atomization, literature discusses atomization techniques, versatility of spray dryer designs and flexibility inherent in units.

Bulletin points out features of machine, and with illustrations, details the different atomizing wheels available for various applications.

6368 on Reader Service Slip.

Economically concentrate cheese whey

Four-page brochure outlines features of a whey concentrating system that uses an evaporator of special design for moisture removal.

System is stated to have heat-transfer efficiency of 95 per cent and as a result of fuel savings, it should be possible to sell final product at a price sufficient to at least cover all operating expenses of process.

Brochure, A New Approach to Whey Disposal, contains a large flow diagram which shows this process and a photo which shows some of the equipment used. Literature is available from Hall & Company, Inc.

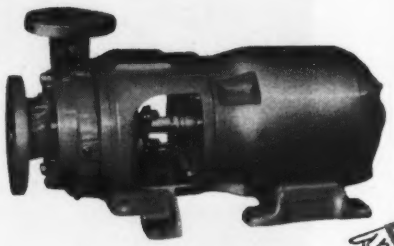
6369 on Reader Service Slip.

"Told you before I dropped it that it was real heavy."

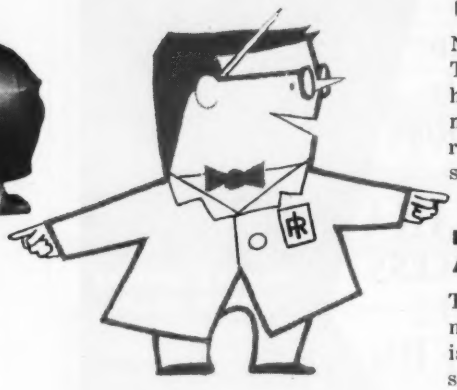
when you discuss pumps what does

NPSH

mean to you?



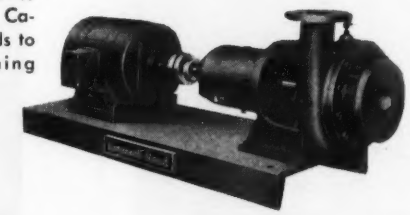
Close-coupled Motorpumps ¼ through 75 horsepower. Capacities to 3200 gpm—heads to 650 feet. Also self-priming models.



THE TECHNICAL DEFINITION

NPSH means NET POSITIVE SUCTION HEAD and is the total suction head in feet of liquid absolute, determined at the suction nozzle and corrected to datum, less the vapor pressure of the liquid in feet absolute.

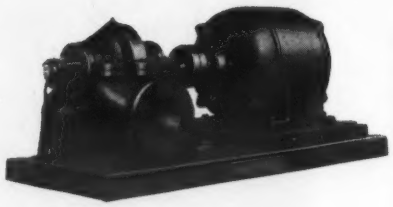
Cradle-mounted pumps ½ through 100 horsepower. Capacities to 3200 gpm—heads to 525 feet. Also self-priming models.



BUT THERE'S ANOTHER MEANING TOO

To trained Ingersoll-Rand sales engineers the technical meaning of NPSH is taken into account every time a pump selection is made. Many other factors including the piping system, current conditions, friction, specific gravity of the liquid, viscosity, etc., are evaluated. And, because we do a most thorough selection job we like to think of NPSH as "NO PUMP SELECTED HAPHAZARDLY." This leads to customer satisfaction, something we are proud of.

When you're having a pumping problem, why not call on an Ingersoll-Rand pump specialist. There's one as close as your nearest Ingersoll-Rand branch office or authorized I-R pump distributor. Perhaps the pump you need will fall within our extensive commercial pump line.



Horizontally-split pumps 1½ through 400 horsepower. Capacities to 4000 gpm—heads to 1100 feet.

Ingersoll-Rand

251A9

11 Broadway, New York 4, N.Y.

OTHER PUMPS TO 200,000 GPM—PRESSURES TO 6500 PSIG.

6370 on Reader Service Slip.

The only complete line... NIAGARA STAINLESS STEEL METERS
METERS in capacities as low as 1 GPM to a high of 160 GPM. Model DV (right) size 1"- 1¼"- 1½", Model BNV (left) size ¼". Other sizes up to 2".
Now in a Sparkling "LUSTRE" Finish... INSIDE AND OUT... EASIEST TO CLEAN.
The most complete line . . . the widest capacity range . . . the smoothest finish — you get them all in the new Niagara Stainless Steel Meters. Special "lustre" finish manufacturing process provides surfaces clean and smooth — inside and out. Minimizes pitting, corrosion, and product contamination. These new Niagara Meters are the easiest to clean inside and out. Combine these added features with Niagara's time-tested accuracy and dependability and you have a combination of qualities not found elsewhere. Remember too, only Niagara Stainless Steel Meters offers a wide selection of internal components to meet your process needs. Industries throughout the nation rely on Niagara Meters to measure and control fluid flow — increase production — cut costs. For complete information write for your copy of Bulletin 46.

Subsidiary of American Meter Co., Inc.

BUFFALO METER COMPANY, INC.

2917 Main Street, Dept. FP • Buffalo 14, N. Y.

SALES REPRESENTATIVES THROUGHOUT THE NATION

6371 on Reader Service Slip.

How to continuously ble... small amount of liquid wit...

Spray onto falling, hollow stream of particles

One of three Verticones, arrow, in new testing laboratory of Johnson-March Corporation, which is available for analysis of problems associated with continuous addition of liquids to solid particles.

Testing facilities were specifically designed for demonstration purposes and for speeding up processing tests — which are free of charge — on customers' materials.

Before material is run through Verticone, it is tested in simple rotating-drum conditioner to determine whether liquid and solid will mix without balling, caking or setting up. Equipment is also available for other tests

Simp... parti... feed... cone... cone... ¼-in... der.

Sp... liqui... parti... onto...

SOLIDS... be use... specific... applying... granules... vided n...

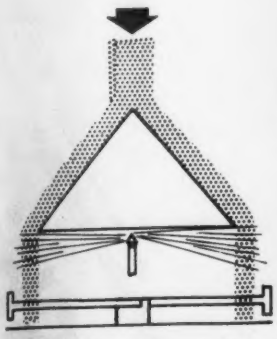
Alrea... a contr... ture int... ing vita... flour, a... pound... adding... flakes,... been su... heated... emulsio...

Since... tively s... no dam...

Additi... material... regulate... material... per cen... uid flow...

Low f... rials can... termitte... tempora... can be... long as t... age to...

blend with solids



Simplified diagram shows how particles, introduced through feed tube, fall over distributing cone. Particles leave base of cone in form of a thin-sheet — ¼-in. to ⅜-in. — hollow cylinder.

Sprays beneath cone dispense liquid to coat surfaces of falling particles. Treated material drops onto rotary table which, aided by rotating cleaning blades, discharges particles. Materials also can be dropped directly into chute, conveyor or processing equipment.

Basic Verticone (above) consists of only five main elements for easy cleaning and maintenance. External parts latch together; require no bolts, nuts. Internal parts such as cone lift out

SOLIDS CONDITIONER can be used for introducing a specific amount of moisture, applying colors or coating granules, flakes or finely divided material.

Already in use for injecting a controlled amount of moisture into powdered milk, adding vitamin solution to fortify flour, adding aromatic compound to instant coffee and adding liquid sugar to corn flakes, conditioner has also been successfully used with heated fats and molasses, and emulsions and mixtures.

Since material falls a relatively short distance, there is no damage to product.

Addition of liquid to dry material can be accurately regulated by controlling bulk-material flow to within ± 5 per cent, and controlling liquid flow.

Low flow rates of dry materials can be handled on an intermittent basis by providing temporary storage. Thus, unit can be run continuously as long as there is sufficient storage to provide uniform flow rate (within ± 5%) during period of flow.

Vibrating screw feeders are recommended by manufacturer if existing equipment does not feed within these limits.

Liquid flow rates and dispensing equipment will vary with viscosity of the fluid. For liquids with viscosities in range of water, standard proportioning and dispensing equipment can be used.

Verticone, made by Johnson-March Corporation, 3018 Market St., Philadelphia, Pa., is made of stainless steel, constructed to meet sanitary codes. Access doors are provided for easy cleaning and whole unit can be readily disassembled, see photo above.

Parts subject to wear, such as distributing cone, retention plates, rotating cleaning blades and rotary discharge table are reinforced with removable wear plates.

Verticone is offered in three standard units which range in capacity from 150 lb/hr to 150 tons/hr.

6372 on Reader Service Slip.

what makes A-P-C craftsmen?

Loyalty . . . pride of workmanship . . . skill — these are the qualities that make an A-P-C craftsman. A manufacturing specialist in stainless steel, the A-P-C craftsman has made the future of Alloy Products Corp. his future. Setting for himself highest product standards, he takes special pride and care in making every A-P-C product a product that fulfills your stainless steel needs best. These qualities combined with engineering know-how . . . complete, modern production facilities — all under one roof — guarantee products with longer service life and lower maintenance costs. A-P-C stainless steel craftsmen keep your profits in mind on every job.

Craftsmen in Stainless Steel

Just a postcard brings a quick reply to all your stainless steel requirement questions.

SINCE 1929

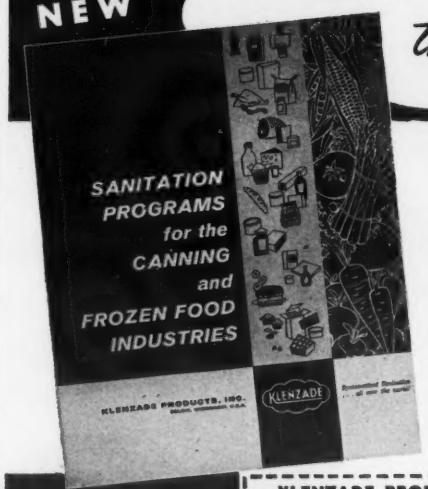
ALLOY PRODUCTS CORP.

1076 PERKINS AVENUE • WAUKESHA, WISCONSIN

6373 on Reader Service Slip.

NEW NEW NEW

Every Food Plant Manager Should Have a Copy of this Folder!



KLENZADE

PLANT QUALITY SANITATION PROGRAMS

Points the way to TOTAL cleanliness in all departments . . . by employing today's advanced technological developments, methods, and products in food plant sanitation and quality control.

MEMO TO SECRETARY

Fill out and Send to KLENZADE

KLENZADE PRODUCTS, INC., Beloit, Wis., Dept. 31D

Please send a copy of "Sanitation Programs for the Canning and Frozen Food Industries" to:

INDIVIDUAL .....

COMPANY .....

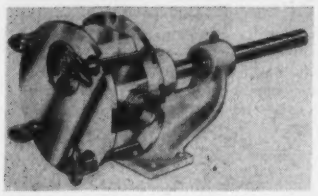
STREET .....

CITY ..... ZONE ..... STATE .....

6374 on Reader Service Slip.

Easy-to-pipe, easy-to-clean pump

Uses-Features: For pumping milk and other liquid food products, new line of pumps has opposite-port, octagonal casing which can be readily turned to change pipe connections from horizontal to vertical. Only one bolt need be removed to change casing.



Pump model shown has mounting bracket and stub shaft for in-line or V-belt drive connection. Pump is also made with wall-mounting bracket for installation in pick-up trucks

Because ports for pipe connections are opposite each other on casing, power requirements are lowered somewhat.

Description: Sanitor, opposite-port, positive displacement pumps are made for 35, 50 and 90 gpm, all at maximum pressure of 50 psi.

Pump works on gear-within-gear principle: a small eccentrically mounted pinion rotates within a larger, centrally mounted gear.

Supplier: Viking Pump Company, Cedar Falls, Iowa.

6375 on Reader Service Slip.

Quick-cleaning sanitary sifter

Uses: For small-and medium-sized runs where overs do not exceed 5 per cent of input.

Features-Description: Pedestal-type sifter is designed to meet sanitary specifications.

It has a circular, 18-in. diam sifting bowl which is made of spun stainless steel. Bowl is split so that it can be quickly taken apart by release of a special clamping device.

There are no ledges, cracks or crevices inside bowl on which particles can accumulate. Screen cloth is attached to circular, SS screen frame

our customer technical service laboratory solves a problem like this every day in the year

dried potato flakes

Designers and manufacturers of processing equipment for the chemical and food industries • DRUM DRYERS • VACUUM ROTARY DRYERS • VACUUM SHELF DRYERS • FREEZE DRYERS • AUTOCLAVES FLAKERS • ESSENCE RECOVERY SYSTEMS • And the industry's most complete line of EVAPORATORS

Taking the work out of mashed potatoes isn't the only problem in producing dried potato flakes. When put on the table they have to look, taste, and feel just like the kind Mother used to make. And they have to be produced at the lowest possible cost to meet today's shrinking profit margins. Salada-Shirriff-Horsey, Ltd. of Alliston, Ontario, Canada, had just this problem — and then, like so many others, it became our problem.

Our Customer Technical Service Laboratory came up with the answer as they do over 360 times each year. Here is what happened.

THE PROBLEM — Potatoes vary in water content. High water content potatoes make a low solids feed that, when applied to a conventional drum dryer, made a lacy, bulky end product. To reduce bulk it had to be packaged with a compression filler. Low water content potatoes are just fine, but are not always available. As the raw material varied, the finished product varied. Buflovak's customer wanted a product of a uniform high quality, produced economically.

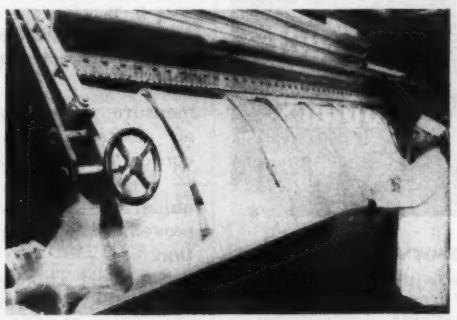
THE SOLUTION — Buflovak's Research and Engineering Departments studied the problem and arrived at a solution in the form of a dryer specifically designed to overcome all of the problems involved in drying potato flakes. Among the many features designed into the dryer is a special feed arrangement that results in flakes of precisely controlled density regardless of varying solids in the feed, as well as an additional applicator roll that vastly improves performance.

THE RESULTS

1. The required uniform high density, regardless of raw material variation.
2. Reduction of product losses.
3. Less expensive packaging procedures.
4. Reduction of initial installation and operating costs.

If you have a food processing problem we can help you too. As manufacturers of many types of processing equipment we can recommend the right equipment without bias. Tell us what you want to accomplish. Our engineers will run tests by the beakerful or barrelful in our completely equipped research center.

A collect phone call to TX 5-2100 will get action. Or write for Catalog 392, or see our insert in Chemical Engineering Catalog. Buflovak Equipment Division, 1559 Fillmore Avenue, Buffalo 11, New York.



A 5 ft. x 16 ft. Buflovak Drum Dryer produces a high density sheet of dried potato flakes at this Canadian food processing plant.

Buflovak Equipment Division

BLAW-KNOX

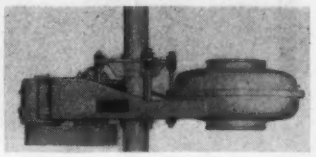
BLAW-KNOX

Blaw-Knox designs and manufactures for America's growth industries: METALS—Rolling Mills • Steel Processing Lines • Rolls • Castings • Open Hearth Specialties • PROCESSING: Process Design, Engineering and Plant Construction Services • Process Equipment and Pressure Piping • CONSTRUCTION: Concrete and Bituminous Paving Machines • Concrete Batching Plants and Forms • Gratings • AEROSPACE: Fixed and Steerable Antennas • Radio Telescopes • Towers and Special Structures • POWER: Power Plant Specialties and Valves

6376 on Reader Service Slip.

that can be readily lifted out when bowl is opened.

Screen area of sifter is 1.4



Sifter can be furnished with base for stationary installation, with casters for mobility, or with fittings for ceiling suspension

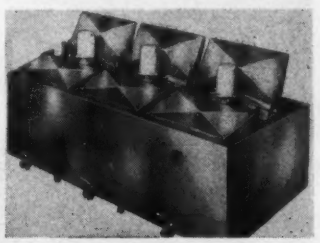
sq ft and power for gyratory motion of sifter is transmitted from ¼-hp motor.

Supplier: Sprout, Waldron & Co., Inc., 130 Logan St., Muncy, Pa.

6377 on Reader Service Slip.

Multi-compartment tanks of many capacities

All stainless, sanitary tanks with two, three or four compartments are presented in four-page brochure, available from Paul Mueller Company. Tanks range in 11 sizes from



Three-compartment, 150-gal/compartment tank with hinged covers and 1½-in., clamp-on valves

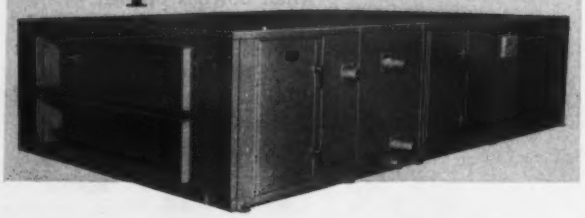
100 gallons per compartment to 1000 gallons per compartment.

Standard models are insulated with two inches of fibre glass and corkboard, and are equipped with agitators, selected for their application. Agitators are driven by 1/3-hp, right-angle gearmotors.

Brochure contains several large photos of these tanks and describes in detail their standard as well as optional equipment. Capacities and dimensions are tabulated.

6378 on Reader Service Slip.

King KLIMATIC KING "70"



assures ultra-clean air conditioning

Klimatic King series 70 units are designed to supply efficient heating, ventilating, filtering and cooling needs for food processing areas.

Air is passed through two filters . . . the first, a standard washable type, to remove larger dirt particles; the second a high efficiency dry type that has a cleaning efficiency comparable to electronic precipitators.

This exceptionally clean air cuts plant maintenance costs . . . improves quality control. Constant fresh air supply and air circulation reduces excess humidity...keeps room dry...reduces mold and bacteria growth . . . improves working conditions.

Klimatic King units are easy to clean, may be mounted in or out of building.

Write for detailed technical and information bulletins.

KLIMATIC KING — King COMPANY OF OWATONNA
911 North Cedar St. • Owatonna Minn.
Manufacturers of sharp freeze, cooling, ventilating and heating systems.

for pre-cooling and preserving foods

Series "M" King Koolers operate with low velocities in the cooler to maintain temperatures of 34° to 50° F., using ammonia or Freon refrigerants. Centrifugal blowers pull air through the cooling coil for efficient heat transfer. Featuring automatic temperature and refrigerant control, system defrosts during off cycle. Water defrost methods are also available.

King Product Koolers are easily and quickly installed and serviced . . . assuring economy, efficiency, safety. Ceiling suspended and floor types are available in a complete range of sizes from 3,000 to 18,000 C.F.M.

PRODUCT KOOLERS — King COMPANY OF OWATONNA
911 North Cedar St. • Owatonna Minn.
Manufacturers of sharp freeze, cooling, ventilating and heating systems.

6379 on Reader Service Slip.

processing

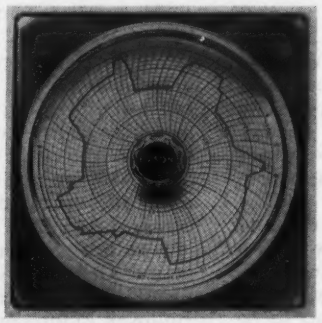
Miniature recorder prints without ink or ribbon

Uses: For recording electrical voltage, current, power or any variable, such as temperature or pressure, which can be converted into an electrical signal.

Features-Description: Miniature recorder prints by means of stylus on pressure-sensitive, 3-in. diam graph; needs no pen, ink or ribbon.

Only 3¾ in. by 3¾ in. by 3 in. deep, recorder has simple gear shift mechanism for setting rotation of chart to any of three speeds.

Inexpensive Omnicorder is made with any of four basic types of meter movements to



Up to nine miniature recorders can be mounted in area of one sq ft. They can also be mounted in Grouse Hinds explosion-proof instrument enclosures

measure wide range of dc or ac electrical quantities. Recorder feeds electrical signal — even as low as 10 micro-amperes — directly into meter movement without amplification.

Supplier: Thomas A. Edison Industries, McGraw-Edison Company, 61 Alden St., West Orange, N.J.

6380 on Reader Service Slip.

Lists six electric batch-weighing systems

Automatic and manual electric, batch-weighing systems are the subject of a new, 20-page bulletin, available from Gilmore Industries, Inc.

Bulletin B-100 presents information on the following standard batch-weighing sys-

how much do you miss
without
this?
SPRAYING SYSTEMS
Spray Nozzles
COMPLETELY DESCRIBED AND ILLUSTRATED IN CATALOG 24—WRITE FOR YOUR COPY
The most comprehensive spray nozzle catalog ever printed. Thousands of designs and sizes . . . unequalled choice of capacities, characteristics and materials. The result of over twenty-five years of specialized research, design and manufacturing.
SPRAYING SYSTEMS CO.
3213 RANDOLPH STREET • BELLWOOD, ILLINOIS
ADVANCED DESIGN • GREATER PRODUCT CHOICE • PROMPT SERVICE

6381 on Reader Service Slip.

Companies with a critical eye on the cost of pumping corrosives use

AMPCO CENTRIFUGAL PUMPS

Stainless steel, Ampco metal, Illium "G", elastomer- and rubber-lined pumps — *available from stock.* Engineered to resist velocity, corrosion, and erosion. Special-pump features at standard-pump prices.

Let your Ampco Field Engineer help *you* cut pumping costs. Write us for his name.

AMPCO METAL, INC. Dept. 229-D Milwaukee 1, Wisconsin
West Coast Plant: Huntington Park, Calif. • Southwest Plant: Garland (Dallas County), Texas

6382 on Reader Service Slip.

tems: tank-weight indicator and controller; tank-weight indicator, totalizer and controller; multiple-ingredient tank-weight indicator and controller and multiple-ingredient weight-control system.

There is also an automatic ingredient weight-control system and an automatic multiple-ingredient weight-control system with printed record.

Details on features, equipment and operation of various systems are included.

6383 on Reader Service Slip.

Battery-operated portable recorder

Features: Completely self-contained and requiring no external connections other than signal input, portable

Weight of portable potentiometer is 17 lb, and overall dimensions are 7 by 5¼ by 10 in.

recording potentiometer is fully transistorized and battery operated. In normal use, life of battery is 250 hours.

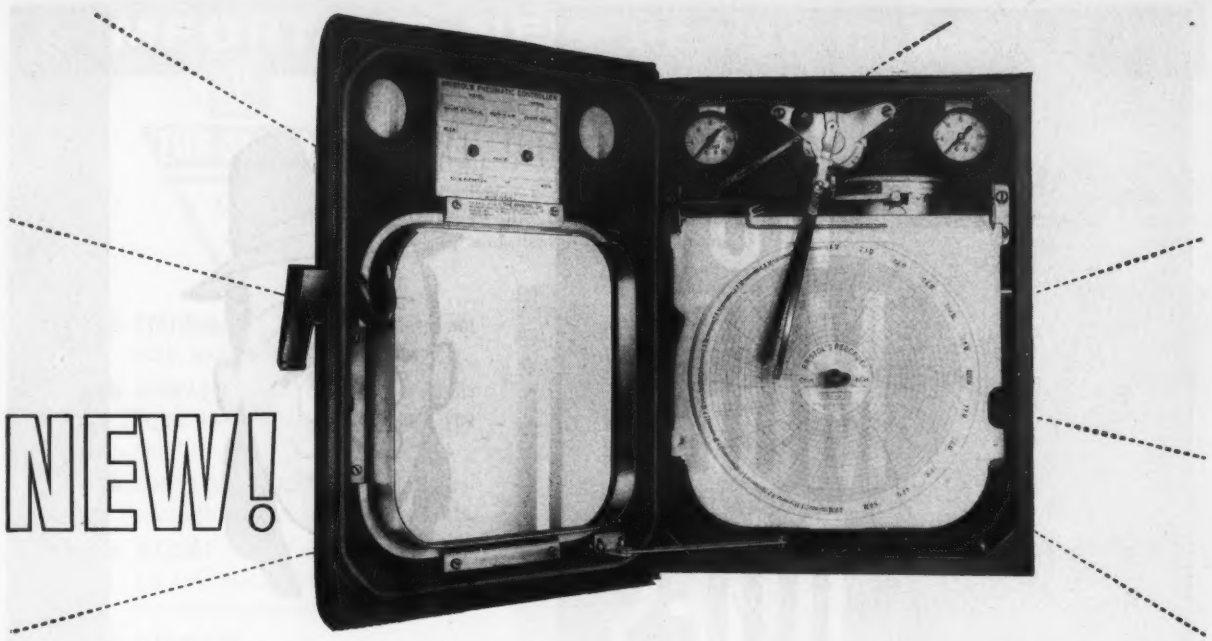
Instrument has an overall accuracy of better than 0.5 per cent and full-scale deflection ranges are between 0-5 millivolts and 0-100 millivolts.

Description: Portable potentiometer has chart driven by clockwork motor which has an eight-day movement. Standard chart speeds are ½ to 12 in./hr. Input impedance is 15,000 ohms.

Chart used in recorder is three inches wide, made of wax paper for inkless recording.

Supplier: Instrument Corporation of America, 516 Glenwood Ave., Baltimore 12, Md.

6384 on Reader Service Slip.



Bristol Series 532 A/D* pneumatic recording controller is outstandingly SIMPLE, RELIABLE, and STABLE

- **Simple modular design for ease of servicing**
- **High control stability for closer process control**
- **Designed for batch-type and continuous processes**
- **Proportional, proportional-plus-reset, and proportional-plus-derivative control models available**

Top control performance with maximum simplicity plus standard Bristol precision measuring elements—those are the key features of the Bristol Series 532 Recording Controller. The 532 uses the same renowned elements that have earned such a reputation for accuracy and dependability on other Bristol automatic controlling and recording instruments—perfected through wide experience and many years of development.

Self-contained modular design of the control unit speeds servicing. The whole modular unit, consisting of an aluminum casting with working parts made of stainless steel, Ni-Span C, and Neoprene diaphragms, can be removed by taking out only two screws and a link.

The die-cast aluminum instrument case (15¾ x 10¾ x 5¾ overall) presents a streamlined appearance and is completely dustproof and weatherproof.

Write for complete data on the new, versatile, economical 532 A/D. The Bristol Company, 143 Bristol Road, Waterbury 20, Conn., a Subsidiary of American Chain & Cable Company, Inc. 0.46

ACCO

CONTROL UNIT CHARACTERISTICS:

PROPORTIONAL BAND: 0-400% continuously adjustable, direct- or reverse-acting.

RESET: 0.1 to 100 repeats per minute.

DERIVATIVE: 0 to 10 minutes derivative time.

AIR PILOT: Non-bleed type.

PILOT CAPACITY: Over 3.0 scfm.

FREQUENCY RESPONSE: Essentially flat to 300 cycles per minute.

TEMPERATURE STABILITY: Less than 0.1% change in the output pressure for 90°F temperature change.

CHART: 8" diameter; wide variety available.

MATERIAL: Aluminum housing; 316 stainless steel internal parts; Ni-Span C feedback element.

RECORDING CONTROLLERS OFFERED FOR:

PRESSURE AND VACUUM: Ranges from full vacuum to 15,000 psi.

TEMPERATURE: Ranges from—100°F to +1000°F.

FLOW AND DIFFERENTIAL PRESSURE: With mercury-type manometer and dry-type differential unit.

LIQUID LEVEL: With bulb unit and mercury manometer and dry-type differential unit.

HUMIDITY: Zero to 100% relative humidity.

*Advanced Design

BRISTOL ...for improved production through measurement and control

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

6385 on Reader Service Slip.

HOW MUCH DOES A CONSUMER COMPLAINT COST?

A LITTLE CARE IN THE CHOICE OF YOUR SUPPLIER WILL GO FAR IN CUTTING COMPLAINTS AND REJECTS.

That's why Precision Valve Corporation takes a lot of care in processing their valves . . . quality controls at every step of the way reduce the chances of rejects to a minimum, and continuing research reduces the minimum.

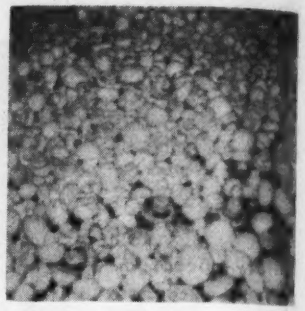
Take care... take Precision Valves for your aerosol products.

PRECISION VALVE CORPORATION
700 Nepperhan Avenue, Yonkers, N.Y.

6386 on Reader Service Slip.

Retain palatability of mushrooms with new freezing process

Mushrooms frozen by a new process, developed jointly by Country Club Foods, Inc., and Flavor-Lok Corp., retain their white color, flavor and crispness.



Frozen mushrooms leaving freezer

According to Carl B. Henrichson, President of Country Club Foods, superior appearance and palatability of mushrooms frozen by new process show up primarily after cooking and cooling.

Details on process are not available at this time.

Supplier: Country Club Foods, Inc., 16 Commonwealth Ave., Claymont, Del.

6387 on Reader Service Slip.

In-line flow transmitter for liquids or gases

Magnarator, an indicating and transmitting rotameter, consists of a pneumatic transmitter that is magnetically coupled to, and integrally mounted with, a variable-area meter.

Installation is "in line," and flow through metering tube is vertically upward. Transmitter element can be used with any metering tube and float combination from ½ to 2-in. connection, covering maximum flows equivalent to 1 to 100 gpm water and 4 to 400 scfm air. Accuracy is to within ± 1 per cent.

Rotameter is illustrated and described in six-page, Catalog 10A2150, available from Fischer & Porter Co. Literature points out features of instru-

ment and explains, with illustrations, principle of operation.

There are photos of various models, and meter's materials of construction and pressure ratings are tabulated. Specifications of instrument, as well as capacities and dimensions of five meter sizes are listed.

6388 on Reader Service Slip.

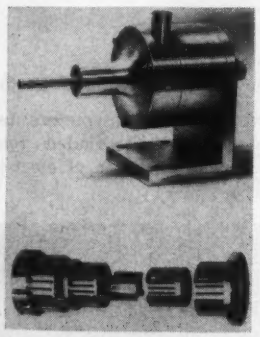
Shears while pumping to emulsify or blend

Uses: For emulsifying, blending or mixing wide range of products.

Features: Shear pump is designed to produce positive, continuous blending of wet with wet or wet with dry products; will also develop suction lift and discharge head.

Action of pump produces virtually no heat gain in product. "Dwell time," for maximum uniformity of particle size, is controlled by valve on pump outlet line.

Description: Shear pump consists of rotors and stators



Shear pump action is without aeration. However, aeration can be incorporated when desired

which can be varied in combination, depending upon product requirements. There are a minimum of 750,000 cuts per minute.

Pumps are available with wide range of rotors in single, double or triple stages. They can be operated at various speeds.

Supplier: Hobam Incorporated, PO Box 91-115, Buffalo 17, New York.

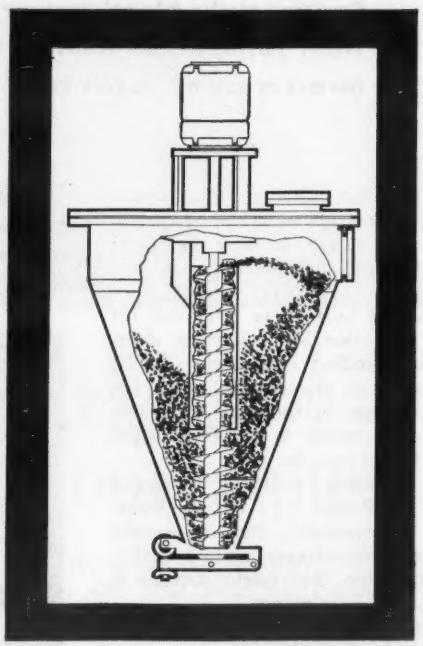
6389 on Reader Service Slip.

IMPORTANT, NEW design in MIXERS

TUR-BLEND...SIMPLE, HIGHLY EFFICIENT DESIGN BY G-B

TUR-BLEND is a new and important design in mixers, combining many desired features in one mixer. The TUR-BLEND unit is stationary, compact, simple efficient, and flexible, and can be made in a wide range of capacities.

- **STATIONARY**... TUR-BLEND does not whirl, no safeguards are required.
- **COMPACT**... The TUR-BLEND is hardly bigger than the size of the load you mix.
- **SIMPLE & EFFICIENT**... Simple operation with a minimum of moving parts.
- **FLEXIBLE (1)**... The vessel and central tube may be jacketed for heating or cooling operations.
- **FLEXIBLE (2)**... The vessel may be enclosed for vacuum-drying of free flowing materials.
- **CAPACITIES**... Sizes: 24" to 96" diameters; and volumes: 2 to 185 cubic feet.



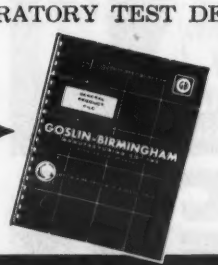
◀ Here's the way this new mixer blends together particles or solutions simply, safely and efficiently.

The new TUR-BLEND is a vertical vessel with an internally and centrally positioned material lifting screw. Its turbo-type dispersing blades briskly distribute particles at the top, with subsequent gravity flow to the bottom, where the lifting cycle is rapidly repeated. Blended material may be quickly discharged through the bottom outlet.

Write or call us for more comprehensive information on the new G-B TUR-BLEND.

CONSULT G-B FOR LABORATORY TEST DEMONSTRATION

Ask for G-B "Facts and Figures" ►

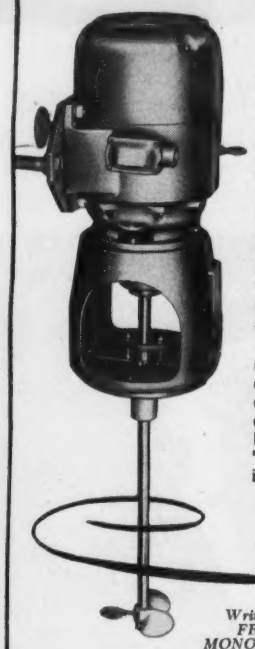


GOSLIN-BIRMINGHAM
MANUFACTURING COMPANY, INC.
P. O. BOX 631 / BIRMINGHAM ALA.

6390 on Reader Service Slip.

MIXING PROPELLERS

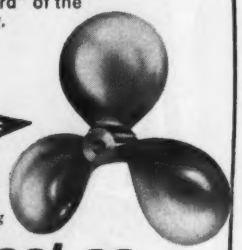
3" thru 72" Diameters



michigan

INDUSTRIAL PROPELLERS, like all Michigan propellers, are manufactured by the exclusive Machined-Pitch Process. The guaranteed absolute accuracy of these propellers makes them a "must" for agitating, mixing or pumping, especially when long shaft mounts are necessary. The incomparably accurate balance and blade indexing eliminate vibration and shaft "whip" to greatly prolong the life of your apparatus.

Stainless Steel, Bronze, Aluminum, or almost any alloy you desire is available in a wide variety of propeller types. The superior quality of Michigan Industrial Propellers makes them the "standard" of the industry.



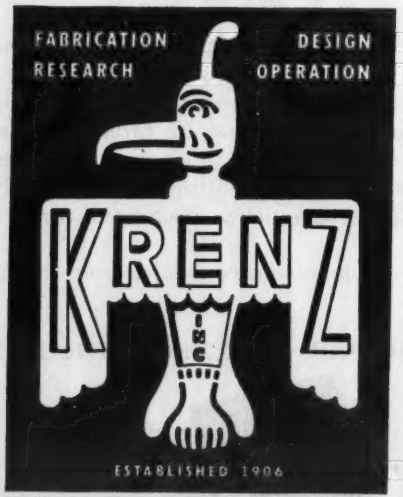
Write for FREE MONOGRAPH and Industrial Propeller Catalog

michigan wheel co.

GRAND RAPIDS 2, MICHIGAN, U.S.A. 1-6R

6391 on Reader Service Slip.

ALLOY PROCESS VESSELS



PROCESSING EQUIPMENT that PAYS OFF in PERFORMANCE!

- Evaporators
- Vacuum Pans
- Flash Break Units
- Mixing Tanks
- Condensers
- Heaters
- Rotary Coil Vessels
- Kettles
- Essence Recovery Systems

OSCAR KRENZ INCORPORATED

ASHBY AT SIXTH STREET
BERKELEY 10, CALIFORNIA
Telephone THornwall 5-1400

Write for complete details

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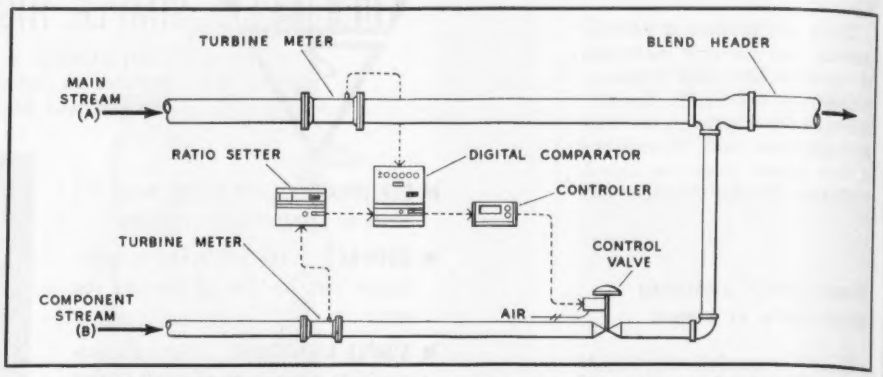


Simplest in-line blending system consists of five basic components: 1. turbine flowmeter in each line which develops pulse signals of a frequency proportional to flow rate in its line; 2. ratio setter on which operator sets predetermined ratio of main stream (A) to component stream (B); 3. digital comparator which receives pulses from ratio controller and main stream; 4. electronic controller that receives "process" signal from comparator and develops control signal to operate valve; 5. control valve with transducer on component stream (B)

End to tank batching?

Continuously blend two or more liquids in constant ratio, regardless of flow variations, with an accuracy of ½ per cent

ACCURATE BLENDING of two or more liquids when one of them (usually the main stream) is subject to flow variations can be solved without the necessity for tank batching.

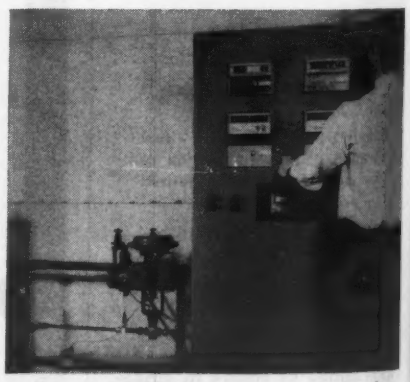
New blending system is designed for continuous operation but relatively short runs can be handled effectively. To be practical, however, it ought to be in use a large percentage of the time to justify the investment, which is $5500 to $8000 for a two-stream system.

In-Line Blending System, developed by Fischer & Porter Co., 801 Jacksonville Road, Warminster, Pa., is equally adaptable to a two-stream, as to a multi-stream installation that might include 6, 10, 20 or more components.

Overall accuracy of system is limited almost entirely by ultimate measuring accuracy of turbine flowmeters used. Accordingly, accuracy of ± 0.5 per cent of reading of each flow stream is readily achieved. Reproducibility is ± 0.2 per cent or better.

Basic, two-stream system consists of two turbine meters, three electronic components and one control valve, see diagram above, and provides a fixed total-quantity ratio of one stream to another.

Components. Turbine flowmeters used with system have multi-bladed rotors and develop precise number of electrical



Two-stream blending system set up in Fischer & Porter's laboratories. System is basically same as shown diagrammatically above. It is modified by addition of a batch controller which shuts off pumps on both lines after preset total is reached, and direct-reading totalizer which indicates total flow of additive

Fragile fruit can't bruise because our pumps give it "hand-carried" care!

We've solved the problem of canning production... *bruising!*

Our new Non-Clog Pumps for food processing are *bladeless!*

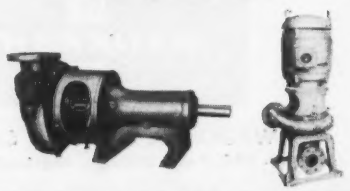
Now—everything you process... from peaches to perch (even fragile fruit cocktail) flows quickly to your canning lines, cradled in a protective cushion of *water* that gently transports it.

Our bladeless, Non-Clog Pumps have special impellers that handle solids many times larger than other pumps.

Your profit picture can look a whole lot better when you can with our "hand-carried" care.

We'll be happy to help you. Send for bulletin. Write to: **Fairbanks, Morse & Co.; Pump & Hydraulic Division; Kansas City, Kansas.**

2 Pump Types Give Everything (Even Eggs) "Hand-Carried" Care!

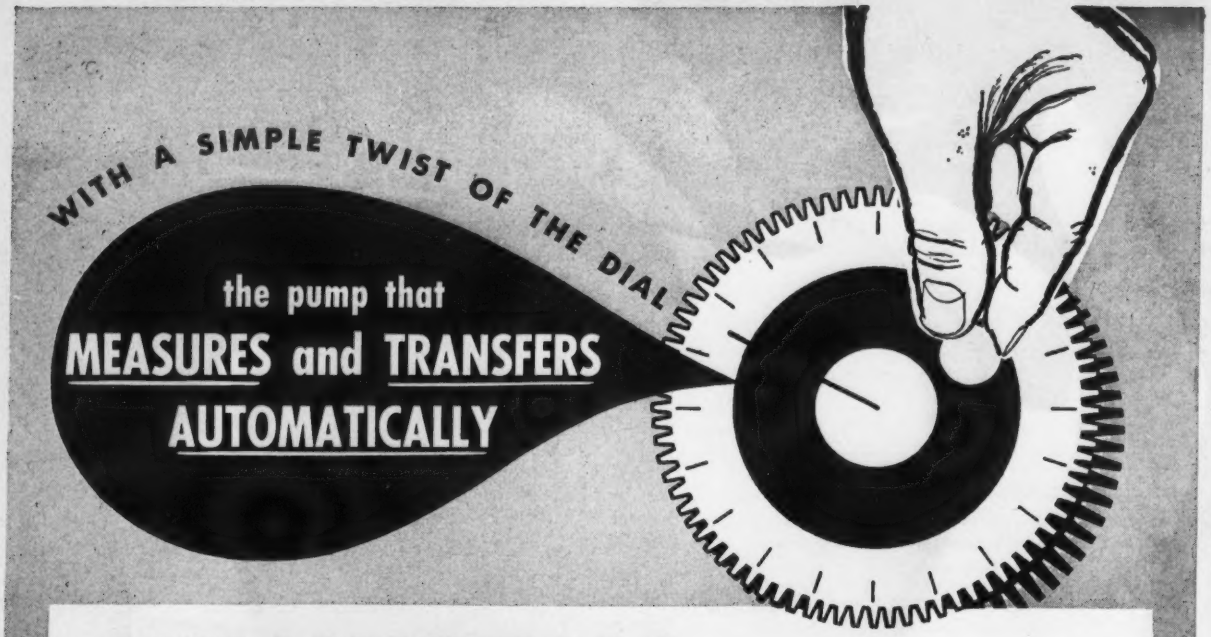


FAIRBANKS MORSE

A MAJOR INDUSTRIAL COMPONENT OF

FAIRBANKS WHITNEY

For more information on product at right, circle 6393 see information request blank opposite last page.



WAUKESHA ACCURACY WITHIN 0.5%

MFC-250 metered flow control pump

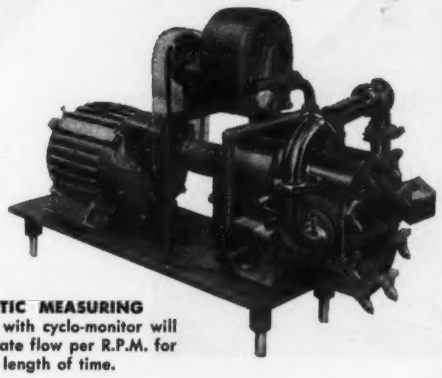
PAT. APPLIED FOR

Now — the first positive displacement pump that both measures and transfers. *Now* — accurate batch measurements with the simple twist of a dial . . . assures product quality — always. No sub-standard batches — ever. Replaces your present transfer pump . . . automates your product stream. Hundreds of uses — wherever a product is measured with accuracy and transferred with care.

The MFC-250 is made of corrosion resistant (fully sanitary 3A approved) 316 Stainless Steel. A new "dualobe" rubber impeller is featured on the MFC 250 and assures a quiet, less turbulent transfer of product.

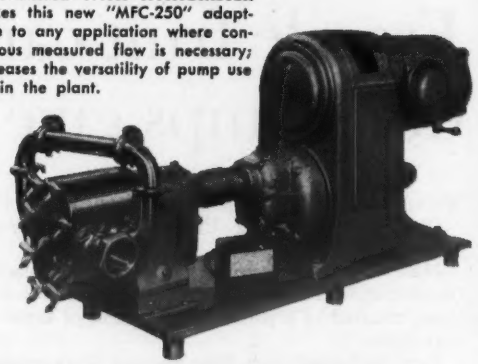
Let a Waukesha engineer consult with you . . . show you how the MFC-250 can "automate" your processing system.

Write for Bulletin P-320 today.



AUTOMATIC MEASURING gearhead with cyclo-monitor will give accurate flow per R.P.M. for any given length of time.

VARI-DRIVE WITH TACHOMETER makes this new "MFC-250" adaptable to any application where continuous measured flow is necessary; increases the versatility of pump use within the plant.



WAUKESHA

WAUKESHA FOUNDRY COMPANY
Dept. 92C, Pump Division, Waukesha, Wisconsin

INTERNATIONAL SALES: FMC International, Box 1178, San Jose, California, U. S. A.

6394 on Reader Service Slip.

pulses for discrete volumes of fluid passing through.

The ratio of the two flows is set on the Ratio Setter. It receives incoming pulses from meter in stream (B) and scales them up or down according to desired total-quantity ratio.

Digital comparator provides a running total of cumulative count differences between pulses from two turbine flowmeters (in two-stream system). Count difference is displayed, together with a plus or minus sign to indicate direction of deviation.

Comparator produces an analog voltage output, proportional to count difference, which serves as "process" input to electronic controller.

Electronic controller compares the analog voltage with a fixed set point representing "zero" cumulative count difference. It develops a 1-5 milliamp dc control signal to position control valve till condition of zero cumulative count difference in digital comparator is satisfied.

Diaphragm motor valve has integral or separate current-to-pneumatic transducer. Tranducer converts controller signal into proportional air pressure to position valve as dictated by electronic controller.

To signal in case count difference exceeds acceptable limit, comparator has adjustable, preset alarms built in.

Modifications. In basic two-stream system, adjustable ratio setting is graduated in arbitrary, rather than in calibrated units.

System can be modified with auxiliary digital indicators that convert flowmeter pulses to engineering units such as gallons. Each stream is then concurrently totalized and ratio setter will read directly in ratio units.

Digital comparator that compares pulses between turbine meters can also be used to compare pulses between a meter and a reference pulse source.

For multi-stream systems, a variable-frequency oscillator provides a master-pulse reference. Desired total system

flow rate can be set directly in engineering units (g/m or bbl/hr) and proportion of total blend that each component is to represent is set directly as a percentage.

Oscillator also measures and displays total flow of each component.

A preset "batch controller" can be used to operate from a flowmeter in the blend header. It will shut down entire system when a predetermined quantity of blend has been delivered.

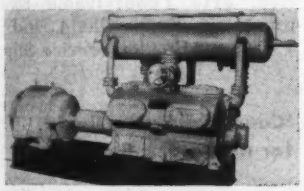
There is also an analog flow-rate indicator or recorder which can be used for component as well as total-blend flow rate.

6395 on Reader Service Slip.

Up to 40-ton, two-stage compressors

Twelve-cylinder, two-stage refrigeration compressors are well suited for low temperature applications where floor space for machinery is an important factor.

Made in capacities up to 40 tons, they can be supplied for



For desuperheating refrigeration gas, high and low stages are connected by 16-in. diam intercooler

systems operating with ammonia, Refrigerant 12 or 22.

Compact, VMC compressors have inside partitions which separate booster and high-side sections. Eight cylinders — center bank and one outside bank — are low pressure while bank on other side is high pressure.

Compressors can be fitted for direct drive or V-belt drive. Fifty percent unloading or capacity reduction is optional.

Supplier: The Vilter Manufacturing Company, 2217 S. First St., Milwaukee 7, Wis.

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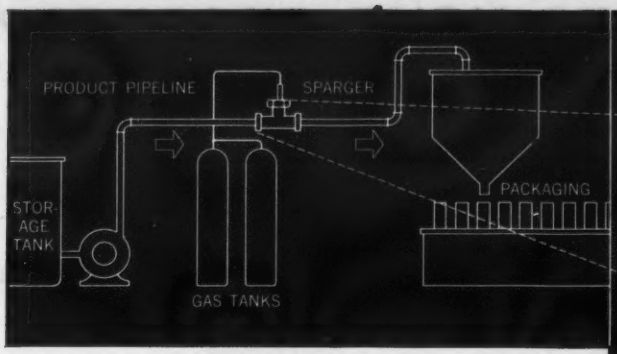

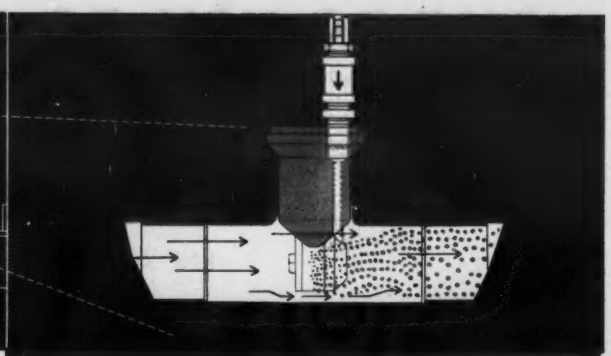

An exciting new method for — removing oxygen from foods and beverages • fluffing • controlled fermentation of wines • light carbonation of beverages.

Airco gas sparging

EFFICIENT
LOW COST
EASY TO INSTALL

The Airco Gas Sparging process is a new technique of injecting gas into liquid or semi-solid foodstuffs, juices, wines, oils, salad dressing, etc. as they are being processed. Its purpose is either:

1. To preserve product quality by flushing out oxygen, or
2. To fluff the product by super-saturating it with minute gas bubbles.

Specifically, sparging accomplishes the following: Removal of oxygen from oxygen-sensitive liquids such as citrus juices, edible oils and essential oils, wines, etc. with nitrogen or CO_2. • Fluffing of mayonnaise, salad dressings, shortening, peanut butter, ice cream, etc. with nitrogen. • Controlled fermentation of wines with oxygen, nitrogen, and CO_2. • Light carbonation or effervescence of wines and other beverages with CO_2 or N_2O.

The Unique Airco Gas Sparger:
This clean, simple, compact unit does the job during the process flow with no disturbance of existing equipment. It is easy to install, low in price, efficient.
For further information about Airco Gas Sparging of your products—fill out this coupon—mail it today.

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NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

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WHAT DO YOU DO TO YOUR PRODUCT?

DO YOU
CRUSH IT
IN A
MEAT GRINDER?

DO YOU
SMASH IT
IN A
HAMMER MILL?

some people don't, you know,

some people cut their product into little dices.

PICKLES for the meat industry are now cut into ¼" or ⅜" cubes.

PICKLE RELISH of high quality is now cut into ⅛" cubes or pieces of ⅛" x ⅛" x ¼".

CHEESE is now being cut into little and big dices. Roquefort cheese is easily diced at a temperature of 10°F.

MEAT with little fibre content such as bologna is cut into small dices for sandwich spreads and other products.

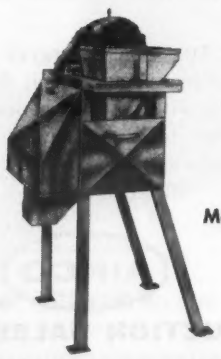
CHERRIES for ice cream dip or other purposes, are cut into little dices.

ALL KINDS OF FRUIT are cut into various small dice sizes for use in numerous products.

NUMEROUS PRODUCTS are now also being cut into julienne strips or thin slices with the "RA".

All of this is accomplished with the Urschel Model "RA" at capacities of up to 10,000 pounds per hour.

We'll be glad to test *your* product in our modern product cutting research kitchen. Write us today.



Model "RA" Dicer

PRECISION HIGH-SPEED FOOD CUTTING EQUIPMENT

URSCHEL LABORATORIES INC.
VALPARAISO, INDIANA

Designers and manufacturers of precision, high speed cutting equipment for food products.

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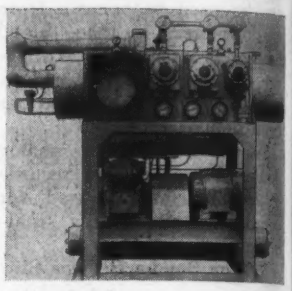
3 to 150 ton packaged liquid chillers

For chilling water or other liquids, units are specifically designed for hazardous locations. Explosion proof and custom built, liquid chillers are self contained and pre-



Liquid chillers are pre-wired and equipped with control center

assembled; require only connection to power and pipe lines for start up.

Liquid chiller units are available with either air- or water-cooled condensers. Temperature control of fluid, according to the manufacturer, is precise.

Supplier: George Koch Sons, Inc., Thermal Products Division, 2112 Pennsylvania Expressway, Evansville 4, Ind.

6399 on Reader Service Slip.

'Counts' flowing liquid for automatic flow control

Four-page folder describes and illustrates Model 524 Preset Totalizer, an automatic counter that provides pre-set, remote control for fluid measuring in batching, mixing or blending.

Instrument, will count any pre-set total between 0001 and 999900 pulses or units of measurement. It is of compact, modular plug-in construction, transistorized and wired with printed circuits.

Bulletin No D-222, available from Potter Aeronautical Corporation presents with diagram a typical small-plant installation. Also included are response-sensitivity curve, specifications, and dimensions for panel mounting, rack and half-rack mounting.

6400 on Reader Service Slip.

plants, companies, personalities,

General Foods Corporation

announces executive promotions and changes involving two divisions. Maxwell House Division: Warren Powers from production services manager to production manager for the division. Jell-O Division: Robert A. Stringer from operations manager of GF's Franklin Baker unit in Hoboken, N. J., to Jell-O division operations manager; V. D. Ludington, research manager of the Post division to be in charge of research and product development for Jell-O division; Richard Laster promoted to Franklin Baker operations manager, succeeding Stringer; Oran Kirkpatrick promoted to manufacturing and engineering manager at Franklin Baker, succeeding Laster; Harvey Bower to the newly created position of manufacturing and research manager for Minute Potatoes; Charles Elsesser, from section head in the Jell-O packaging research section to director of the Jell-O packaging research manager to production laboratory.

Prosser Packers Inc.

Prosser, Wash., has doubled capacity and plans to operate on a year-round basis as result of adding new frozen potato facilities to existing facilities for handling asparagus, other vegetables and fruits. Anticipated annual poundage is expected to be 25 million.

New England Confectionery Co.

has acquired Daggett Chocolate Co., and will operate the latter firm as a subsidiary. Manufacturing operations will be consolidated at New England Confectionery's Cambridge, Mass., plant. Richard D. Muzzy, Daggett president becomes a vice president of the parent organization.

American Molasses Company

has acquired Food Products Corp., leading supplier of technical ingredients to the baking and dairy industries, as part of a continuing policy of expansion of the parent company's specialty business.

you may be paying for it a second time!

Today, with building costs twice what they were in 1945, your big, old boiler — possibly coal-fired — can cost you money by occupying space that might be used for other needs.

To offset these climbing construction costs and meet the compact requirements of modern architecture, one manufacturer, Cleaver-Brooks, has proved that big boiler performance and capacity can be engineered into a compact boiler package. Today's CB packaged boilers — in addition to solving unusual installation problems, such as low headroom — are releasing sizeable ground-level areas for production or storage purposes. In some cases, "penthouse" installations have utilized space on an upper floor and *completely eliminated* the use of ground-level space.

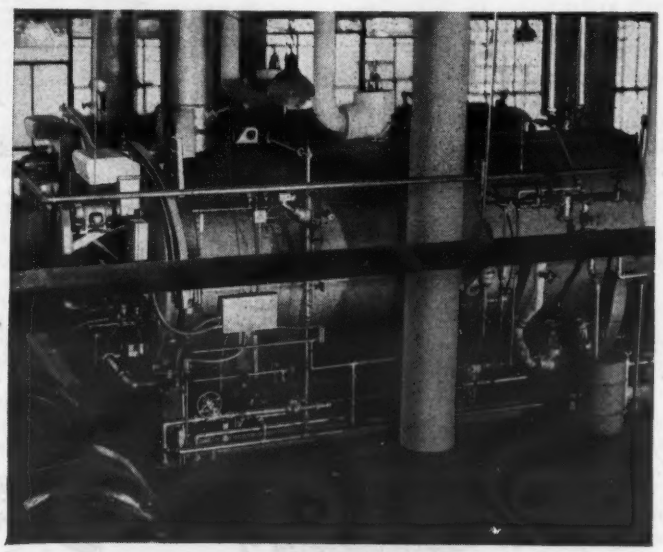
Here are some of the design features that combine for maximum space-saving: four-pass design, forced-draft combustion, updraft construction and all the advantages of five square feet of heat-transfer surface per boiler horsepower. These standards of quality and compactness are only available from Cleaver-Brooks, manufacturers of the most compact, fuel-saving packaged unit on the market.

Cleaver-Brooks boilers are completely pre-engineered and tested as a package . . . expertly started for you by a trained field engineer. Sizes through 600 hp . . . oil, gas and combination oil-gas firing . . . larger sizes in Cleaver-Brooks Springfield water-tube boilers.

Ask your local Cleaver-Brooks agent for more details or write for the booklet, *How to Select a Boiler.*

BOILER ROOM CONVERTED TO WORK AREA

Robert A. Johnston Company, cookie, candy and chocolate products manufacturer in Milwaukee, Wisconsin, replaced four coal-fired boilers with two fully automatic, gas-fired CB boilers. Mr. James Vida, plant engineer, reports: "Compact Cleaver-Brooks design made it possible for us to install the boilers in another part of the plant — in an area of only 750 sq. ft. — releasing the old boiler room, 9000 sq. ft., for storage and work areas. It saved us the cost of an expansion project."



Cleaver Brooks®

ORIGINATOR AND LARGEST PRODUCER OF PACKAGED BOILERS

CLEAVER-BROOKS COMPANY

Dept. D, 357 E. Keefe Ave., Milwaukee 12, Wisconsin

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Thermovac®
OFFERS YOU:

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SANITARY EQUIPMENT

- Stainless Pumps
- Tri-Clover Fittings
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- Essence Extractors
- Process Vessels
- Heat Exchangers
- Stainless Tri-Clamp Fittings (shelf-stock)

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METALWORKING SKILL

- Custom-Built Equipment
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- Rebuilding of Existing Equipment

3
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- Process Design
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Thermovac® is located in the heart of the food producing country, and can answer your equipment needs.
Write, call or wire today!

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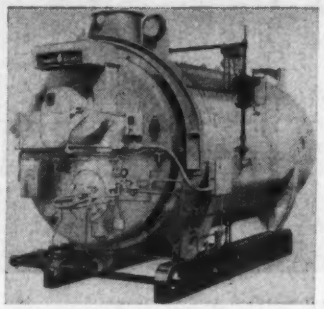
processing

From 15 to 600 hp packaged boilers

Eighteen sizes of automatic, packaged boilers, from 15 to 600 hp, are made in 90 models. Built for either high- or low-pressure steam or hot-water service, boilers can be fired with oil, gas or combination oil/gas.

Features of these fire-tube boilers are illustrated and described in four-page bulletin, available from Cleaver-Brooks Company. Hinged front and rear doors, high-velocity gas burner, air-atomizing oil burner and four-pass construction — which helps to attain 80 per cent efficiency — are taken up in detail.



Single-tip, retractable nozzle is easily removed by flipping drawer latch

There is also a discussion covering the rotary air damper which modulates air, and the forced-draft air system. Arrangement of boiler tubes that provide five sq ft of heating surface per boiler hp is explained.

In addition, literature contains a table that lists dimensional specifications, ratings, approximate fuel consumption and electrical power requirements.

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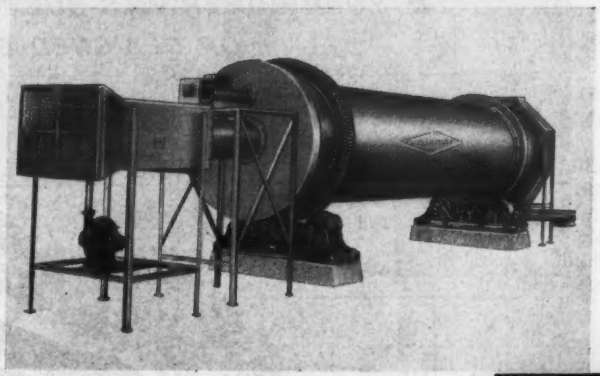
Simple, sanitary disintegrator

Simple but rugged disintegrator can be used for grinding, pulping, crushing, pureeing, sifting, crumbling, blending and mixing.

Compact machine is of sanitary construction. All product-contact parts are made of SS



"DAVENPORT"
ROTARY HOT AIR DRYER
5'-0" x 24'-0"

Now in use — Finish drying whey powder (food product). Made from stainless steel. Finest for food processing. Second installation in major Minnesota cheese plant.

Let our engineers consult with you on your Pressing, Drying and Cooling problems or send for our catalog P. For quick reference consult your Chemical Engineering Catalog.

DAVENPORT MACHINE AND Foundry Company
A DIVISION OF MIDDLE STATES CORPORATION
Davenport, Iowa, U.S.A.

DAVENPORT
PRESSING — DRYING and COOLING Equipment
Continuous DeWatering Presses
ROTARY DRYERS
Steam Tube, Hot Air and Direct Fire
Atmospheric DRUM DRYERS
ROTARY COOLERS
Water and Air

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New dry process imprinter for pouches, bags, wraps, strip packs

Even heat sealers won't rub off markings!

"WRAP-A-PRINTA"® packaging machine imprinting attachment Patented

• Makes crisp, opaque, really permanent impressions in any color • Uses low-cost roll leaf instead of ink . . . perfect for "hard-to-print" films, coated foil, waxed paper • Fits in idle space on all pouch, bag, wrapping, bundling machines • Fully automatic . . . synchronizes perfectly with continuous or intermittent web feed • Imprints anything from tiny code-date to 4" x 2" design • Ideal for short cutoffs on pouch machines — as short as ½"!

For full details write for "Bulletin RAP-1"

First and foremost in automatic production-line CODING, MARKING and IMPRINTING machines
Gottscho®

GOTTSCHO Dept. V
HILLSIDE 5, N.J.
In Canada: Richardson Agencies, Ltd. Toronto and Montreal

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and product inlet and outlet is either through piping with sanitary threads or large, outside-flange chutes.

RP disintegrator is described and illustrated in two-page, Bulletin RP-1, available from Rietz Manufacturing Company. Literature presents features of machine and lists specifications. Three standard methods of feed and discharge piping combinations shown.

6406 on Reader Service Slip.

Easy draw-off with tilting drum warmer

Uses-Features: For heating drums of viscous liquids such as chocolate, honey or shortening, drum warmer is particularly useful in applications requiring frequent, small-batch draw-offs.

Mobile drum warmer can be readily moved from one station to another with drum, and is tilted to horizontal position for rapid flow.

Drum warmer is tilted for fast, gravity drainage of high-viscosity liquids

Description: T-H, 55-gal drum warmers are equipped with removable handles and 4-in. diam wheels. To prevent heat loss, they are insulated with snug-fitting asbestos gaskets.

Units are made in two thermostatically controlled temperature ranges: 60 to 250 F and 100 to 450 F. Warmers are wired for various plant voltages, both single phase and three phase.

Supplier: Harold L. Palmer Company, 28625 Grand River Ave., Farmington, Mich.

6407 on Reader Service Slip.

Creamery Package®

ENGINEERED
REFRIGERATION SYSTEM
assures

JUST-CAUGHT FLAVOR

at RUBENSTEIN and SONS, Inc.
DALLAS, TEXAS

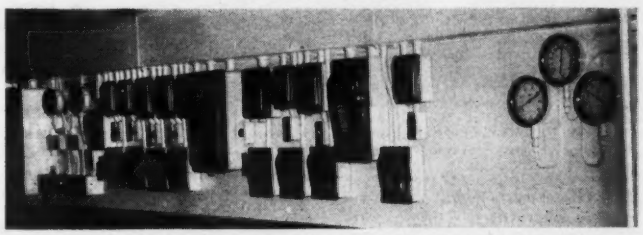
Ralph Granberry, Production Manager, inspects final breading of Gulf Princess fan tail shrimp. Batter for breading is circulated by CP Sanitary Centrifugal Pumps, through stainless steel lines.

Automatically controlled refrigeration, holding and freezing are key to Gulf Princess quality

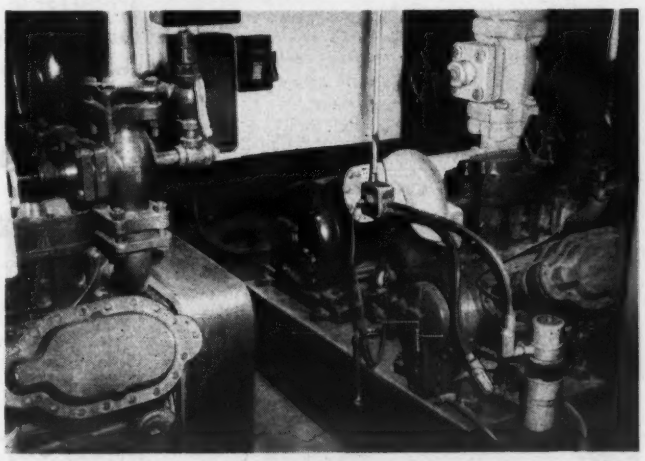
Creamery Package is proud to have been supplying the refrigeration needs for the people at Rubenstein since 1949. Today, to capture and maintain the just-caught flavor of Gulf Princess shrimp and other products, a completely CP engineered system supplies about 130 tons of refrigeration.

In addition to the compressor and booster system, CP installed the automatic control panels that govern and record the whole refrigeration operation —the equipment in the blast freezers and holding rooms—the regenerative water chilling system—cooling room facilities (for cracker meal and wax paper storage). CP also installed the King Sharp-Freeze system for freezing packaged breaded shrimp in the —30° room, the centrifugal sanitary pumps for circulating the breading batter and the stainless steel fittings and lines to breading machines. Plus temperature and humidity control equipment for Rubenstein's pecan packing and storage rooms.

This CP system is another example that in refrigeration or any facility related to it, CP engineers have the know-how, experience and equipment to do the whole job—or any part of it—to get the results *you* want. Can we help you? Write any of our branches listed below.



Automatic control panel governs and records whole refrigeration operation.



CP Compressors and Boosters, such as two shown here, provide 130 tons of refrigeration for entire system, freezing, cooling rooms, etc.

THE Creamery Package® MFG. COMPANY
General and Export Offices:
1243 W. Washington Blvd., Dept. FP-461, Chicago 7, Ill.
In Canada: CREAMERY PACKAGE MFG. CO. OF CANADA, LTD.
267 King Street, West • Toronto 2B, Ontario

BRANCHES: Atlanta 8 • Boston 78 (Belmont Station) • Buffalo 3 • Charlotte 3 • Chicago 7 • Dallas 7 • Denver 2 • Houston 3 • Kansas City 1, Mo. • Los Angeles 23 • Memphis 5 • Minneapolis 1 • Nashville 3 • New York 36 • Omaha 2 • Philadelphia 40 • Portland 14, Ore. • St. Louis 8 • Salt Lake City 1 • San Francisco 3 • Seattle 4 • Toledo 4 • Waterloo, Iowa.

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now... Lewis brings Stack-n-Nest® to FOOD PROCESSING

Made with

PolyLewton

(U.S.D.A.-M.I.D. APPROVED)

The remarkable new material developed especially for use in conjunction with raw foods.

- **Easy to Clean** — slick, glass-like, closed surface molded on matched dies to eliminate sharp interior crevices and corners.
- **Easy to Handle** — lightweight (only 3¼ lbs.), full perimeter, top-rim finger grips.
- **Easy to Stack** — special patented design for quick, easy stacking — empty or loaded.
- **Easy to Move** — in stacks or nests — on platform trucks or pallets — between processing operations.
- **Easy to Nest** — nesting stops minimize binding and gripping suction.
- **Easy to Install** — long life at a lower original cost compared to stainless steel.

Lower your handling costs with Lewis PolyLewton Stack-n-Nest Tote Pans . . . send for complete information.

Shipment within 24 hours from receipt of order.

G. B. LEWIS COMPANY

164 Montgomery Street • Watertown, Wisconsin

Material Handling Specialists for nearly a century

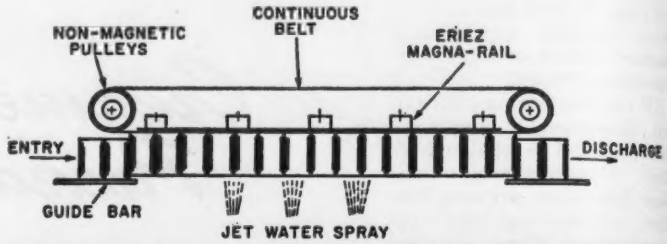
NO CREVICES

to harbor undesirable bacteria and spores

Capacity: 50 lbs.

INSIDE DIMENSIONS 20" x 12" x 8" deep

6410 on Reader Service Slip.



Open-end cans, held by Magna-Rails to underside of continuous rubber belt, speed past upward-directed jets of 100-F water. Location of jets is indicated in diagram above photo

In lower photo, rinser's stainless steel sides are removed, revealing how the speeding cans are suspended from belt above by the Magna-Rails. Arrow indicates where supporting bar ends

Can damage during rinsing had nation's largest grape-juice processor in a ferment! Now, suspended upside-down from endless rubber belt . . .

Empty cans race damage-free through 'magnetic rinser'

PROBLEM: The automatic can rinser is a key unit in the Welchade can line at the North East, Pa., plant of The Welch Grape Juice Co.

Before depalletized and unscrambled open-end cans move to the packaging line, they are carried on cableways into the rinser.

Previously, two fast-moving chains carried cans through the 100-F water rinse. Can rims rested directly on the chains, partially blocking entry of the rinse water.

Further, due to abrasive action of chain links on can rims, can flanges were damaged — sometimes causing line stoppage.

Solution: A series of Magna-Rails — manufactured by Eriez Manufacturing Co., 75 Magnet Dr., Erie 6, Pa. — was installed above the can rinser's endless rubber belt.

The permanent magnets hold the fast-moving, inverted cans securely to the belt as jets of heated water rinse the empty containers.

Result: Elimination of flange damage has greatly reduced line jams and stoppages.

Moreover, line speed — a vital factor in economical canning operations — has been upped from 180 units per min, to 240 cpm.

Production engineers report there apparently is no limit to the can speeds at which the "magnetic rinser" is effective.

6411 on Reader Service Slip.

Polypropylene film characteristics, uses

"Olefane," AviSun Corporation's polypropylene packaging film is subject of new four-color eight-page Booklet AO-100 issued by the company.

A general list of properties is given, and charts and diagrams are used to expand upon the film's water vapor transmission rate, gas transmission, chemical resistance, electrical characteristics, haze and gloss, use temperature, heat sealing and machinabilty, adhesives, labels and printing characteristics.

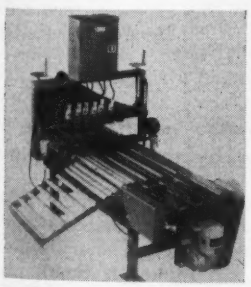
An economic comparison with 10 other popular packaging film types is included. Two printed sheets of the actual polypropylene film are inserted between front and back covers.

6412 on Reader Service Slip.

Ejects any 'light' case — whether open or sealed

Uses: Self-contained Peco Void Case Ejector inspects every case of cans or metal-capped jars or bottles, and ejects those having missing containers.

Unit handles any case pattern (3 by 4 rows, 2 by 6 rows, 6 by 8 rows, etc.) and all standard case heights, including gal jugs, 10-oz beer bottles, mayonnaise, instant coffee jars, all cans, etc.



Model C unit fits into existing conveyor lines; Model NC (not shown) fits over existing conveyors. Neither requires operator

Features-Description: Sensing of irregularity in case pattern is accomplished by proved

new tape that signals "Sterile"

HELPS CUT SPOILAGE TO LESS THAN .01%

Now a new, fast way . . . a more reliable way to be sure canned products have been properly sterilized is helping many food processors cut spoilage. It's "Scotch" Brand Autoclave Tape No. 222.

Apply a short strip to "judas" cans. When tape is exposed to 240°F. or more of uniformly moist retort steam-heat pressure, dark stripes appear – indicating everything's OK. The tape gives positive proof of sterilization . . . a record which may be peeled off easily and filed with other production records. And, it can be written on with ink, pencil or crayon.

Tape No. 222 is just one of the many "Scotch" Brand Tapes designed to help you lower operating costs, speed production. Ask your "Scotch" Brand Tape Distributor to show you how, or write: 3M Co., 900 Bush Ave., St. Paul 6, Minn. Dept. IBC-41.

SCOTCH BRAND

MINNESOTA MINING AND MANUFACTURING COMPANY
...WHERE RESEARCH IS THE KEY TO TOMORROW

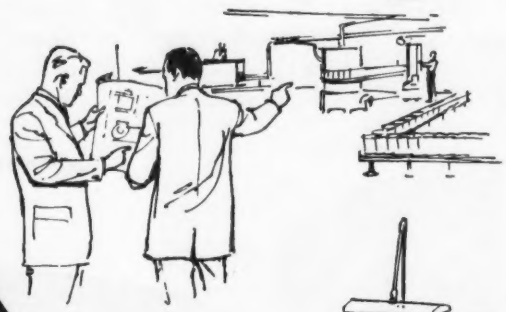
3M COMPANY

"SCOTCH" IS A REGISTERED TRADEMARK OF 3M CO., ST. PAUL 6, MINN.

6413 on Reader Service Slip.

FROM Planning... TO Canning!

THE FINEST CONTAINERS AND SERVICE COME FROM CANCO!



Canco service starts long before production. Canco operates the world's largest food research laboratory and has unmatched experience in canned food product formulation. Its Technical Service people are ready to act as your consultants on the proper use and formulation of raw materials, canning methods and equipment, quality control, or any problem relating to the canning procedure.

Canco's can-handling and plant layout engineers are available for assistance. They are experts in increasing speed and efficiency within your plants.

A staff of professional home economists is available to help you develop new products, evaluate proposed or existing products and to develop recipes.

The aim of Canco service is to produce containers that promise you better packaging, fewer production stoppages, lower packing costs. That means a better product... *more profits for you!*

VISIT
CANCO'S BOOTH
AT THE
IFT CONVENTION

The exhibit is a fallout shelter, approximately 500 square feet, fully equipped to care for the emergency requirements of a family for a two-week period.

CANCO Division AMERICAN CAN COMPANY

New York • Chicago
New Orleans • San Francisco

6414 on Reader Service Slip.

Peco magnetic proximity principle, as case travels beneath two to six sensing heads (depending on the particular case pattern).

Cases may be inspected while open, or when already sealed.

Floor space required is 38 by 68 in. (for Model C unit illustrated), plus area for ejected case take-off chute. Roller ejector is pneumatically operated.

Supplier: Peco Corp., 111 Ortega Ave., Mountain View, Calif.

6415 on Reader Service Slip.

Properties and uses of most-used cellophanes

Properties and principal uses of 31 kinds of Du Pont cellophane — from among more than 100 Du Pont varieties — are presented in highly readable tabular form in new four-page bulletin.

Most of the information is concerned with the moisture-proof, heat-sealing film — including four of the new "K" cellophanes, but some space also is given to intermediate moistureproof films (for tomatoes, certain meat items) and plain or non-moisture-proof cellophanes (for hard-crusted breads and rolls, pies, etc.)

Approximate yield in sq in per lb and approximate thickness for various gauges of each film type are included.

6416 on Reader Service Slip.

Depicts 'most complete' packaging machinery line

Four-page Bulletin P-813 describes the complete line of packaging machinery offered by the Stokes & Smith plant of Food Machinery and Chemical Corp.

Specifications, features and illustrations are included on 10 types of equipment: auger-filling, casing, pouch filling and sealing, checkweighing, contour wrapping, carton filling, tray forming and setup boxmaking.

6417 on Reader Service Slip.

plants, companies, personalities,

Kellogg Company

has appointed Clifford L. Fiala assistant to the general production

C. L. Fiala

manager, with headquarters in Battle Creek. Suceeding him as general manager at Kellogg's Memphis, Tenn., plant is Earl Stine. John Sugden, assistant general manager at the San Leandro plant, succeeds Stine as San Leandro general manager.

California Vegetable Concentrates, Inc.

shortly will move its headquarters from Huntington Park, Calif., to Modesto, adjoining one of the two production sites now operated in Modesto. Huntington Park will continue as Southern Division operations office, and the processing and production facilities in that city will be continued.

Campbell Soup Company Ltd.

Toronto, recently marked its 30th anniversary in Canada by formally opening a new multi-million-dollar, 139,000-sq-ft food processing plant in Portage La Prairie, Manitoba, and announcing completion of a 65,000-sq-ft frozen food plant at Listowel, Ont. Latter is said to be the first plant in Canada constructed for the express purpose of producing frozen convenience foods.

For more information on product at right, circle 6418 see information request blank opposite last page.

WHO PLANTED THE LOG IN THE PLANTS?

Each of these boxes comes from a different Hoerner plant – plants that range from Minneapolis to Mission and Danville to Sand Springs. Eight new plants have been added in the past five years to give better, faster service to more customers. The log? It's from the Hoerner mill in Missoula, Montana. It was planted here to show you Hoerner's integration – – another reason for their dependability.

HOERNER BOXES, INC.

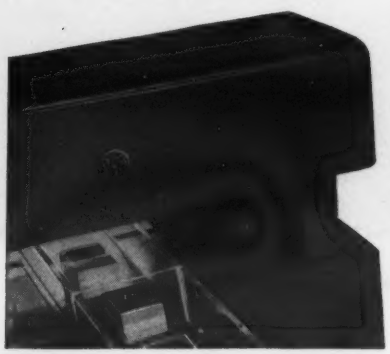
CORRUGATED PACKAGING SPECIALISTS FOR MID-AMERICA

GENERAL OFFICES: 600 Morgan Street, Keokuk, Iowa • MILL: Missoula, Montana • PLANTS: Fort Smith and Little Rock, Arkansas; Danville and Waukegan-Gurnee, Illinois; Des Moines, Keokuk and Ottumwa, Iowa; Minneapolis, Minnesota; Tupelo, Mississippi; Springfield, Missouri; Sand Springs, Oklahoma; Sioux Falls, South Dakota; Fort Worth and Mission, Texas • ASSOCIATE: Cajas y Empaques Impermeables, S.A., Mexico City D.F., Mexico

"Quality-proof" your product with the RCA Electronic METAL DETECTOR

No need to run the risk of contamination from tramp metal. Protect your customers and avoid costly complaints—lawsuits, by finding the things that cause them! Steel, lead, nickel, brass, aluminum—they're all discovered by the RCA Electronic Detector, even pieces as small as .039 in. diameter.

Use the RCA Metal Detector on your conveyors to sound an alarm, or to divert items contaminated by tramp metal. Inspect product in bulk or packaged form. Waterproof aperture can be hosed down. Detector is easy to install, quickly pays for itself. New, low prices. Why wait another day for this low-cost protection? Write to RCA, Dept. T-243, Building 15-1, Camden, N.J.



RCA The Most Trusted Name in Electronics
RADIO CORPORATION OF AMERICA

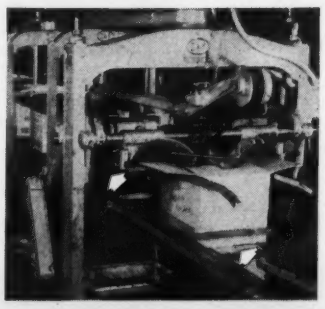
6419 on Reader Service Slip.

fp **PACKAGING**

Key unit at end of the new aluminum packaging line is the Model CKSFK Speed King packer that assembles the filled, closed and code-embossed cans in a 4 by 3 by 2 pack arrangement, and loads the cans, 24-at-a-time, by pneumatic plunger action into carton held in place by a pneumatic drop-off arm (circle). When cartons are filled, a foot-operated air cylinder causes the drop-off arm to right the cartons and lower them onto take-away belt

Convert packaging line to aluminum cans — *in just 48 hours*

Mobil Oil Company's East Boston plant changeover — and subsequent successful operation — have implications for aluminum-minded food industry packers



Case gluer (upper photo) closes carton's two end flaps, while plows open the side flaps for application of glue. These flaps then are closed by second set of plows (lower photo) and carton is transported to compression unit, where flaps are compressed, allowing glue to set. Arrows indicate flow

CONVERTING its quart oil packaging line from steel to aluminum cans took just 48 hr downtime at Mobil Oil Company's East Boston packaging plant, serving all of the company's outlets throughout the New England area.

Reason for the smooth switchover is an amazing group of machines — consisting of unscrambler, elevator, filler, closer, accumulator, packer, case gluer and case-compression unit — provided with a "built-in" conversion

continued on page 82

Model CKSFK Speed King pneumatic packer by Crompton & Knowles Packaging Corp., Holyoke, Mass.
6420 on Reader Service Slip.

Model CKAG automatic case gluer by Crompton & Knowles Packaging Corp.
6421 on Reader Service Slip.

Model CKCU case compression unit by Crompton & Knowles Packaging Corp.
6422 on Reader Service Slip.

Would you like to receive FOOD PROCESSING personally?

It will be sent to you without charge or obligation . . .

. . . if you qualify

. . . if you request it

If you are responsible for processing operations in an administrative capacity as plant superintendent, food technologist, chemist, engineer or equivalent responsibility . . . in a plant of substantial operations* where food processing is an important factor . . . FOOD PROCESSING will be sent to you without charge or obligation if you request it. Use form below. In requesting, be sure to answer all questions. If your firm is not rated or listed in standard references, indicate size of the company by capacity, annual sales or number of employees. Unless all information is given, magazine will not be sent.

*"Substantial operations" does not necessarily mean an extremely large plant. But requests for the magazine exceed supply so we must set standards to insure publication being sent where it can be used to best advantage.

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Title _____

Company _____

Rating of Company _____

Street _____

City _____ Zone _____

State _____

Main Products _____

plants, companies, personalities,

National Starch and Chemical Corp.

has promoted Dr. Walter G. Kunze to the new position of process development

W. G. Kunze

associate, and R. B. Evans to the position of scientists. Both have been responsible for developing new methods for derivation of starch, and developments of new techniques for making starch films.

Beatrice Foods Company

has acquired Rosarita Mexican Foods, Inc., Mesa, Ariz. — manufacturer of a full line of frozen, canned and delicatessen Mexican foods.

Darling & Co.

Chicago, one of the country's largest independent rendering firms, has elected Nelson Morris II president, succeeding William H. McCausland, now board chairman.

Sacramento Freezers Inc.

has purchased Shasta Freezers Inc., Watsonville, as a supplement to its current operations in Sacramento and Yuba City, Calif.

The Wm. Underwood Co.

Watertown, Mass., has purchased Sell's Specialties, Inc., New York City, processor of dietary products.

Westgate-California Corp.

San Diego, processor of Breast-O'-Chicken Tuna and Purr Cat Food, has purchased Girard's, Inc., of San Rafael, Calif., processors and bottlers of salad dressing and seasoned salad oils.

Millions of picnics in corrugated

Broil the burgers. Break out the beer. America's picnic basket overflows with good things to eat. Tons of summertime snacks are shipped in corrugated boxes by Hinde & Dauch Division. Sturdy, lightweight boxes—planned for shipping economy. Leading food producers regard H&D as their primary source for money-saving *corrugated boxes in volume.*

6423 on Reader Service Slip.

West Virginia Pulp and Paper

Hinde & Dauch Division

17 Plants • 42 Sales Offices • Sandusky, Ohio

81

continued from page 80

versatility when originally installed as a high-speed steel can packagaing line early in 1959.

Current production — as with the steel cans — is at an impressive 405-cpm rate. However, Mobil Oil already has in motion a plan to step up to 575-600 cpm — a speed which would use the present equipment at close to maximum efficiency. END

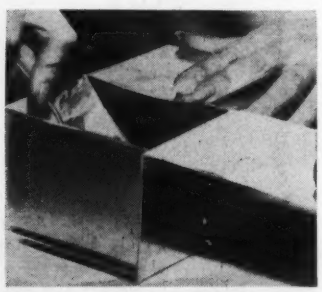
Semi-rigid, airtight package

. . . filled and sealed twice as fast at half the cost

Remarkable new Paktronic packaging system, now being introduced, is based on two developments:

1) what is described by developer as the only airtight, semi-rigid container currently available in the U.S.;

2) a revolutionary food-packaging machine which fills



Side-opening (by means of pull-tabs), "paq" container does away with smeared hands, recloses easily by finger pressure

and electronically seals the containers, or "paqs," twice as fast by conventional methods — and often at half the cost.

First commercial application will be in an Illinois ice-cream plant, sometime this spring. However, other frozen foods, as well as freeze-dried foods (which need not be refrigerated, but must be protected

For fail-proof film seals, Seabrook Farms depends on "SCOTCHPAK." The result is safer, more efficient packaging.

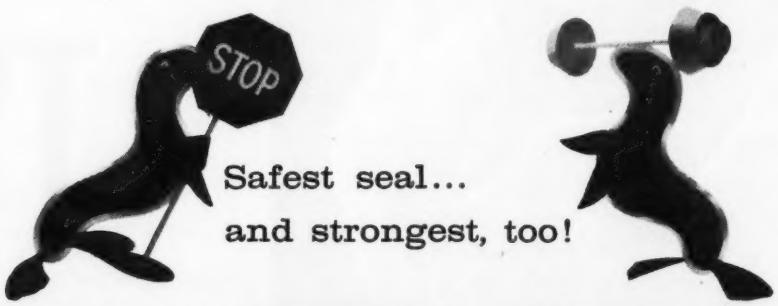
© 1961, 3M CO.; "SCOTCHPAK" IS A REGISTERED TRADEMARK OF 3M CO., ST. PAUL 6, MINN.

seal in film... SCOTCHPAK® BRAND

The stronger, longer-lasting seal of "SCOTCHPAK" has solved the problem of film dependability in food packaging. "SCOTCHPAK" is made differently than any other film. It's specially tailored by 3M with the strictest quality-control supervision. "SCOTCHPAK" heat-seals easily at 300° to 400° F., 20-60 psi pressure, making a seam that is as strong and impermeable as the film itself — a seal that lasts much longer than the shelf life of your product. "SCOTCHPAK" stays pliable, too, at temperatures from —70° F. to 240° F. *If you have been let down by seals that let go . . . or films that fail in any way* . . . it's time you tried "SCOTCHPAK." We will be happy to send you samples and work with your packaging people. Write or call Film Products Group, 3M Co., 900 Bush Ave., St. Paul 6, Minn., Dept. ICC-41,

MINNESOTA MINING AND MANUFACTURING COMPANY
...WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY



For film seals that never lose their grip, follow the example of Armour & Company's Continental Cuisine.

For leakproof film seals, San Bernardino Sausage has found "SCOTCHPAK" to be the answer in selling and serving.

6424 on Reader Service Slip.

from air) are seen as offering great potential markets.

Container is made of exterior aluminum foil on paperboard; inside is treated with a plastic material. Cost-saving over current ice-cream containers is estimated at 25-50 per cent.

"Paq" is leak-proof and air-tight, without need for inner liner of waxed paper and the printed wrapper which is sealed with paraffin.

Since entire exterior is of aluminum foil, it offers distinctive appearance; because of unique sealing feature, there is no bulging problem during storage and display. Printing is flexographic or roto.

Machine fills and seals Paktronic cartons at least twice as fast as conventional units fill and seal conventional cartons; air-tight sealing is accomplished electronically by means of a patented process.

For ice-cream packaging, the unit imprints flavors on the package, and has a built-in quality control factor.

Supplier: Paktronic "paq" blanks, which are laminated, die-cut and printed by The C. W. Zumbiel Co., Cincinnati, Ohio, under license, and the Paktronic machine, built by J. L. Ferguson Co., Joliet, Ill., and to be sold by Paktronic Machine Corp., are developments of Foils Packaging Corp., 307 E. Fourth St., Cincinnati, Ohio.

6425 on Reader Service Slip.

Stories of packaging units 'on the job'

Forty-page booklet, "19 Rugged Individuals at Work," published by Bartelt Engineering Co., Inc., explains how imagination — backed by the right kind of equipment — solved 19 packaging problems.

Included are applications involving tea bags, root beer flavored powder, cocoa portion packs, precooked and dehydrated instant potato, strip packaging of cake and frosting mix for gathering into single carton and inert gas packaging of a soluble dairy product.

6426 on Reader Service Slip.

Simple, semi-automatic packaging machine makes . . .

Shrink-on film practical for baked foods

In May 1960, FP featured news of new CRYOVAC L-Film — a "breathing" polyethylene film with remarkable shrink-on characteristics when blasted with hot air.

Now, newly developed SCM-IV packaging machine makes the film commercially practicable for baked foods in lipped pans — up to 22 packaged units per min with one operator; up to 40 units per min, or 2000 per hr, with two operators.

Process consists of placing a small piece of CRYOVAC L-Film quickly and loosely over filled pan, and shrinking

For average size aluminum foil container, film costs less than ½ cent per package; cover stays intact and is reusable

that film by means of hot air so that it loops over lip of aluminum pan — forming a tight, transparent covering.

The labor of tucking, folding and sealing required in overwrapping are completely eliminated, and 40 per cent less film is used in covering just the top of the pan.

Machine consists of one or two dispensers, which handle film up to 14 in. in width, a conveyor and two shrink tunnels.

After film is cut and dropped over the pans, conveyor carries product through the tunnels. In the first, an overhead wire belt holds film in place

IN THE FOOD INDUSTRY

NOT ONE BUT TWO MAGAZINES!

Yes, that's right; the PUTMAN PUBLISHING COMPANY publishes 2 distinctly different magazines to serve one industry —each serving a distinctly different area of the fabulous food industry

FOOD PROCESSING

To help make better products

FOOD BUSINESS
MANUFACTURERS / SUPERMARKET CHAINS

To help sell more products

Together, FOOD PROCESSING and FOOD BUSINESS represent "total service" to your industry . . . the food industry, America's Number 1 business activity. Each magazine, with its specialized editorial staff, presents to its readers the most important developments, the trends and suggested solutions to problems facing your industry.

Each staff is directed by these men of experience:

Howard P. Milleville
Editor,
FOOD PROCESSING

Frank J. Cogan
Editor,
FOOD BUSINESS

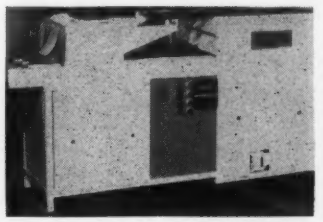
Together, they say: "If we can help you directly, please let us know."

PUTMAN PUBLISHING COMPANY
Putman Publishing Building • 111 East Delaware Place • Chicago 11, Illinois
publishers of: CHEMICAL PROCESSING • QUEST . . . for tomorrow
What's NEW in Plant-Engineering EQUIPMENT

while a blast of hot air from below shrinks the film around pan lip, causing it to "lock on."

In second tunnel, hot air from above shrinks the film across the top, forming a tight, neat cover.

Machine will handle all kinds of baked foods, a variety of shapes and sizes of aluminum pans — squares,



Machine takes just 28 sq ft of floor space, is 14 ft long, 32 in. wide and 49 in. high

rectangles and rounds, unmounded or mounded, individually or simultaneously.

Suppliers: CRYOVAC L-Film by The CRYOVAC Division, W. R. Grace & Co., 62 Whittemore Ave., Cambridge 40, Mass.

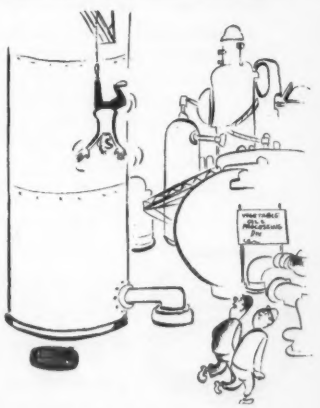
6427 on Reader Service Slip.

SCM-IV packaging machine by The CRYOVAC Division, W. R. Grace & Co.

6428 on Reader Service Slip.

Lipped aluminum foil containers for baked foods by Ekco-Alcoa Containers Inc., Wheeling & Hintz Rds., Wheeling, Ill.

• 6429 on Reader Service Slip.



"I think he's trying to tell us something!"

Belting insurance protects another food processor

Burrell belting insurance is becoming more important than ever to you, the food processor. Your protection is Burrell's 48 years of successfully engineering belts for all requirements.

Burrell Burtek Hy Gene Belt carrying hot, salted potato chips at Jays Foods, Inc. model Chicago plant.

Burrell Burtek Cleated Belt with solid Buna N cleats on Jays "Cheezelets" line.

Burrell belting insurance means:

- the right belt for each specific job
- prompt delivery and follow-up service

Burtek Hy Gene 3 (Buna N) belting provides:

- resistance to heat, fats, oils, food acids, alkalis
- flexibility under wide range of process temperatures
- maximum operating life to minimize down-time and production costs
- easy to clean and keep clean
- will not hold or transmit objectionable odors and flavors
- may be vulcanized or laced endless

• Write for the new catalog describing the full Burrell belting line.

BURRELL BELTING COMPANY
7501 N. ST. LOUIS AVE., SKOKIE, ILLINOIS
Chicago Phone: AMbassador 2-8110
SALES OFFICES IN PRINCIPAL CITIES

6430 on Reader Service Slip.

packaging

Seals poly, pliofilm bags at up to 3000 per hr

Uses: Automatic recycling heat sealer provides regular seals or flap over seals (on packages up to ⅜ in. thick)

One-knob heat control eliminates both thermostat and heat switch. Heat is maintained to ± two degrees

on all size poly and pliofilm bags up to 12 in.

Features-Description: Continuous up-and-down motion of 25 cycles per min, with obstruction-free sealing area, permits sealing two bags at time at speed of 3000 bags per hr.

New "practically indestructible" Teflonized sealing bar eliminates need for Teflon tape. Bar is readily accessible for simple adjustment; if accidentally damaged, it can be replaced for $5.

Innovation of a Nylon cam wheel eliminates need for oil and grease, cutting down maintenance costs and noise.

Supplier: Bag-O-Matic Packaging Equipment Co., 8350 Santa Monica Blvd., Los Angeles 46, Calif.

6431 on Reader Service Slip.

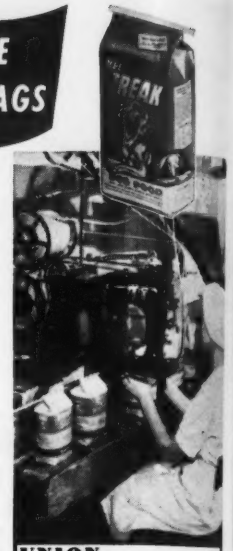
Tips on sealing corrugated cartons

Eight-pg foldout bulletin, "Tips on Sealing," offered by Bostitch, Inc., gives tips on sealing cartons with staples, using a step-by-step comparison with other fastening methods.

In addition, bulletin illustrates a few of the Bostitch machines used to bottom- and top-seal cartons.

6432 on Reader Service Slip.

A BETTER CLOSURE for SMALL PAPER BAGS



UNION SPECIAL'S *Style 60000 D* Bag Closing Machine, producing the exclusive Dubl-Tape closure, is designed to speed packaging . . . cut costs . . . and improve appearance.

- **FAST—Speed to match output of standard filling and weighing equipment.**
- **NEAT—Produces an eye-pleasing, sales-stimulating package with high merchandising value.**
- **ECONOMICAL—Operating cost per bag is at a minimum . . . uses inexpensive cotton thread and paper tape.**
- **VERSATILE—Adjustable for a wide range of bag sizes, short or long runs.**

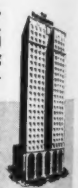
Write for BULLETIN No. 100 to get the complete facts on this machine . . . and how it can do a better closing job for you.

FINEST QUALITY
Union Special® MACHINE COMPANY
432 N. Franklin St., Chicago 10, Ill., U.S.A.
BAG CLOSING MACHINES

6433 on Reader Service Slip.

Four Fine Facilities in PITTSBURGH

ALLEGHENY MOTOR INN
Opposite Greater Pittsburgh Airport. 60 air-conditioned rooms, tile bath, TV, radio, phone. Superb restaurant and cocktail lounge. Year-round swimming pool. Courtesy car to and from airport. **AMherst 4-7790**



HOTEL PITTSBURGHER
In the heart of the Golden Triangle. 400 outside rooms, bath, radio, TV, air-conditioning. General Forbes Lounge & Dining Room. **ATlantic 1-6970**

JACKTOWN MOTOR HOTEL
1 mile west of Irwin Interchange on Route 30. 60 air-conditioned rooms with TV, telephone, combination tile baths. Excellent dining room and facilities for group parties. **UNderhill 3-2100**

HOTEL PITTSBURGHER MOTEL
Opposite Greater Pittsburgh Airport. 56 air-conditioned rooms, tile bath, radio, TV, private phone. Courtesy car to and from airport. **AMherst 4-5152**

KNOTT HOTELS
Joseph F. Duddy, Gen. Manager

*Teletype Service. Telephone any Knott Hotel. All Knott Hotels and offices in U.S. connected by teletype.

Route 30, Lincoln Highway, Shortest Route to Pittsburgh

6434 on Reader Service Slip.

plants, companies, personalities,

Vita Food Products, Inc.

New York, has promoted former executive vice president Aaron Gilman to the

presidency, succeeding Victor Heller, who remains as board chairman.

Corn Products Company

has named Maurice F. Healy, Jr., assistant to the senior vice president, corpo-

rate development. In this newly created position, Healy will assist his superior in matters pertaining to new products and acquisitions.

The Charles E. Hires Co.

newly acquired division of Consolidated Foods Corp., now is headed by Joseph D.

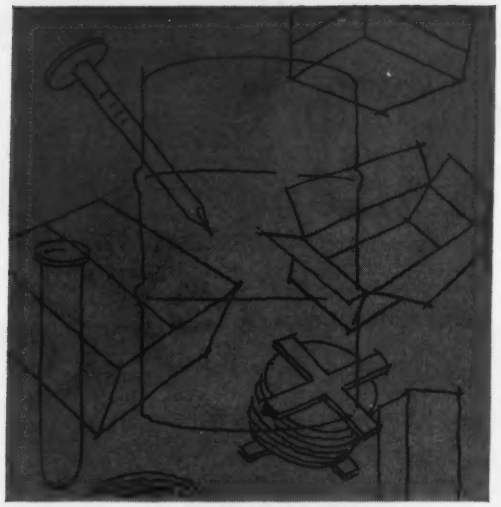
Farrell, who recently served as an executive with Consolidated's Gentry Division.

For more information on product at right, circle 6435 see information request blank opposite last page.

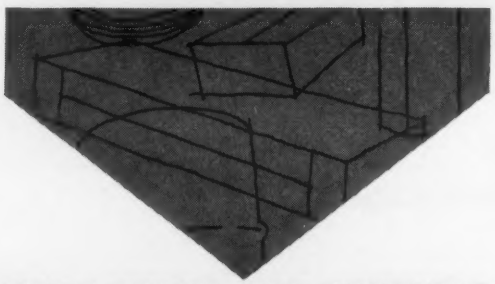
Send us your carton (even if you love it). If we can't beat it on design, printing and strength, at no increase in cost, our name isn't **Olin**

PACKAGING DIVISION

FOREST PRODUCTS OPERATIONS,
P.O. BOX 1225, WEST MONROE, LA.



NOW! "CHECK WEIGHING" CAN BE MORE ACCURATE...MORE ECONOMICAL!



FAIRBANKS-MORSE BENCH AND PORTABLE "FLOAXIAL" DIAL SCALES

Now you can "check weigh" anything for industry (from a one-pound can to a one-ton barrel), in, out, or all about more accurately—more economically! Modern Fairbanks-Morse Dial Scales provide proved accuracy that works for you, year after year. And—because our Scales are built to last longer, you realize long-life economy . . . freedom from repairs or early replacements!

PROVED ACCURACY! Our "Floaxial" Dial Scales are famous for proved accuracy! Exclusive "Floaxial" mechanism eliminates knife edge or pin point pivots, features hard bronze fully adjustable cams, full-floating pendulums. Shielded ball bearings and corrosion resistant working parts assure free movement.

EASIER TO USE! Easy to use and move. Dial head swivels full 360° to any position. Rubber-tired wheels lock and/or Dial mechanism locks. Cast aluminum construction cuts weight.

EASY TO READ! Red knife blade indicator picks out just one scale graduation at a time. Special indicator tip eliminates parallax. Black numerals on brushed aluminum dial. No paint to peel, crack, or craze.

LONG-LIFE SERVICE! Rugged lever systems take shocks of dropping loads and stay accurate! Pivots are hardened steel with precision ground knife edges.

CAPACITIES: BENCH AND PORTABLE DIAL SCALES: Available in capacities from 50-3200 lbs.

3 PLATFORM SIZES: 18" x 20", 21" x 29", 30" x 30" available for both Bench and Portable Dial Scales.

For further information, write: **C. G. Gehringer; Scale Division; Fairbanks, Morse & Co.; 19-01 Route 208; Fair Lawn, New Jersey.**

FAIRBANKS MORSE
A MAJOR INDUSTRIAL COMPONENT OF
FAIRBANKS WHITNEY

6436 on Reader Service Slip.

Lined steel drums m-m-m-m

Vermouth extract shipped cross-country flavor-safe and at cost savings

FOR Vermouth Industries of America, Inc., New York City — biggest U.S. producer of vermouth — steel drums are helping preserve taste and color of meticulously prepared vermouth extract, while concurrently chalking up savings in shipping costs.

Prepared in New York, the extract is shipped to California for blending with more of the base wine — followed by filtering, aging and bottling as the well-known Tribuno Vermouth.

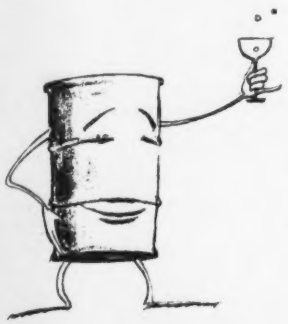
Until about two yr ago, wooden barrels were used for shipments. While evaporation loss (1/10 of one per cent) was a minor problem, the barrels sometimes affected the delicate flavor of the extract during shipment.

Now, the steel drums used have a special air-sprayed lining (pigmented epoxy-phenolic) which imparts no taste of its own to the extract. Further, oxidation and evaporation are non-existent.

In addition, Vermouth Industries realizes about 10 per cent savings in freight shipping charges. The steel drums weigh only 50 lb, as compared with 100 lb for the wooden barrels — each type of container holding 50 gal of extract, 465 lb in weight.

Lined steel drums by Inland Steel Container Co., Div. of Inland Steel Corp., 6532 S. Menard Ave., Chicago 38, Ill.
6437 on Reader Service Slip.

drums help put in martinis

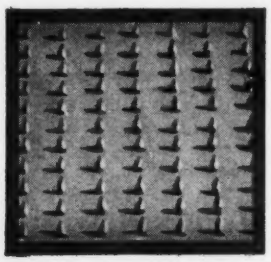


Alex Cremona, plant production manager at Vermouth Industries of America, fills extract into lined steel drum for cross-country shipment

BRAND NEW FROM SIMPLICITY!

3′ x 3′ MULTI-PURPOSE SCREEN

- pricking
- scalping
- sizing
- dewatering
- trash removal
- industrial waste removal



PRICKING PANEL INCREASES THE RATE OF BRINE OR SWEETENING PENETRATION

The Simplicity "pricking panel," shown at left, is entirely new in the industry; it provides fine mechanical perforations of fruits and vegetables and increases the rate of brine and sweetening penetration. Each and every fruit or vegetable passing over this vibrating panel receives many tiny perforations, thus enabling faster and better penetration of brine or sweetening.

The new Simplicity 3′ x 3′ Multi-Purpose Screen, with its complete versatility, offers the entire food industry a revolutionary way to cut food processing costs with higher production speeds, a more uniform product and greater flexibility for multi-purpose use. The Multi-Purpose Screen is adaptable to a number of operations and has been used successfully to size, prick, dewater, scalp and remove trash from a number of fruits and vegetables.

The screening section of the Simplicity Multi-Purpose Screen can be equipped with screen cloth of any specification and can be easily replaced with the new pricking panel. The machine itself can be constructed of mild or stainless steel and stainless steel wire cloth is normally used.

Simplicity offers expert counsel for food screening problems based on unequalled experience in screen applications. For more information on Simplicity food screening equipment, write Department 7, Simplicity Engineering Company, Durand, Michigan.

Simplicity
TRADE MARK REGISTERED
ENGINEERING COMPANY • DURAND 6, MICHIGAN

SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A.

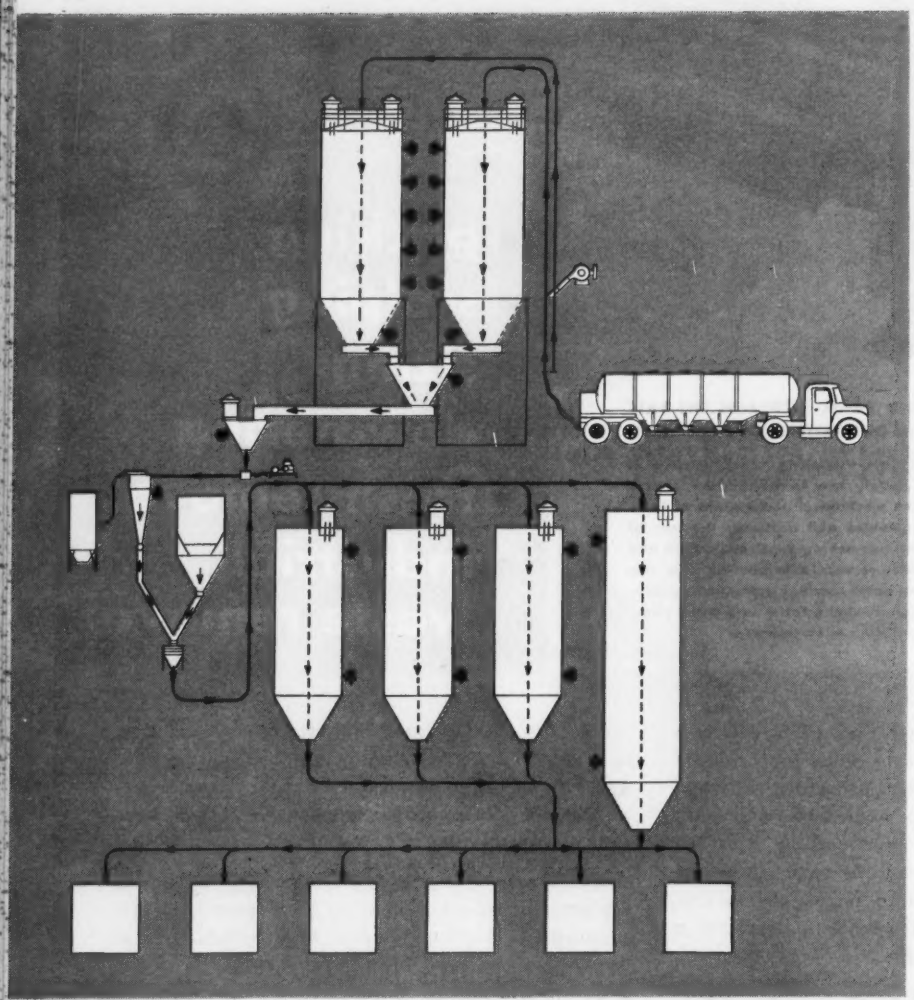
FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario.

FOR EXPORT: Brown & Sites, 50 Church Street, New York 17, N. Y.

6438 on Reader Service Slip.

At Awrey Bakeries, bin-level indicators used for indication, alarm actuation, automatic control provide

Pneumatic flour-handling system ins



Simplified sketch of Awrey Bakeries bulk flour storage and handling system indicates key role played by bin-level indicators at all stages

AT EVERY STAGE in delivery of flour from storage to process, bin-level indicators monitor the flour-handling operation at Awrey Bakeries, Inc., Detroit.

For example, each of the two 14-by-30-ft outside bulk storage tanks is equipped with six Roto-Bin-Dicators — five at successive fill levels on side of tank, and the sixth near mouth of the discharge hopper.

When flour from bulk tank truck reaches the fourth level on a storage tank, an alarm sounds, warning the truck operator. When maximum level is reached, topmost level indicators automatically stop truck's feed mechanism.

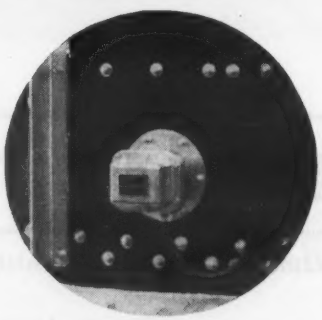
From storage, two nine-in. screw conveyors, designed to handle flour at an adjustable rate between 6000 and 24,000 lb per hr, convey flour to a collecting hopper.

Both the mouths of the discharge hoppers on the storage tanks and the collecting hopper have Roto-Bin-Dicators that automatically shut off feed as required.

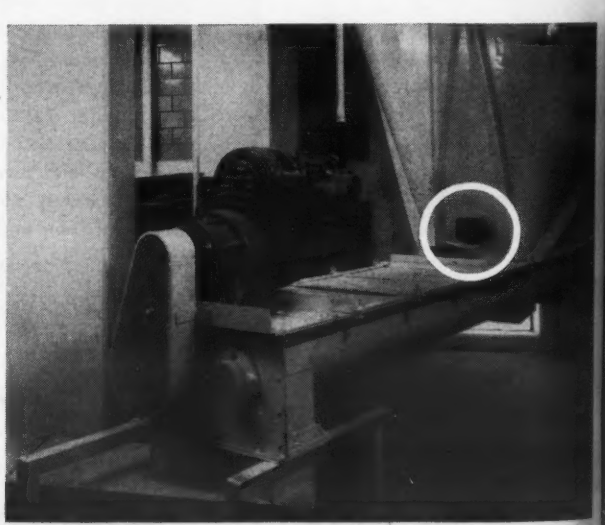
From here, flour is fed into a steam-jacketed hollow-flight screw conveyor that is, in effect, a heat exchanger designed to heat 20,000 lb per hr of wheat flour from 40 to 75 F.

A long-cone collector — equipped with a high-level Roto-Bin-Dicator — separates conveying air from flour. At top of collector, a scroll-type discharge outlet passes air and the remaining dust to a filter unit.

Material passing through the cone enters an air lock which spouts collected flour into a sifter. Beneath the sifter is a



Close-up of one of six Roto-Bin-Dicators mounted at different levels on outside of bulk flour storage tank



Bulk storage tanks discharge into twin nine-in. screw conveyors which lead to collecting hopper. Note Roto-Bin-Dicator near mouth of storage tank's discharge hopper

instrumented for trouble-free flow

conveying system which takes the flour to any of the four in-plant use bins — all equipped with high-and low-level Roto-Bin-Dicators to signal operators or to automatically control bin levels.

Suppliers: Roto-Bin-Dicator bin-level indicators by The Bin-Dicator Co., 13946 Kercheval, Detroit 15, Mich. 6439 on Reader Service Slip.

Pneumatic conveying equipment by Sprout, Waldron & Co., Inc., 130 Logan St., Muncy, Pa. 6440 on Reader Service Slip.

In-plant use tanks and automatic mixing stations by Baker-Perkins, Inc., Fraser & Young Streets, Saginaw, Mich. 6441 on Reader Service Slip.

In normal operation, flour from the bulk storage tanks is routed to the largest of these in-plant bins. The three smaller bins are filled with flours that are used in smaller quantity. (These bins are filled through a dump-bin station — filled manually — that feeds into sifter at head of conveyor feeding all the in-plant bins.)

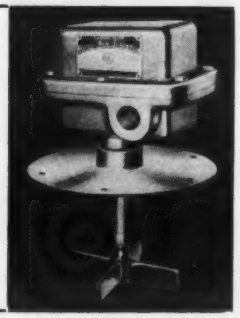
A single electrically interlocked pneumatic conveyor system delivers specific types of flour, on demand, from any of the in-plant bins to five automatic mixing stations and to a sixth station where tubs may be rolled into position when special mixes are required.

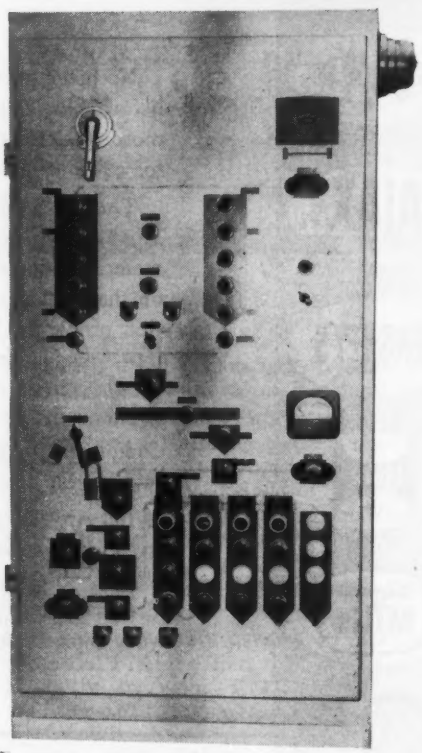
System has paid off for Awrey Bakeries, Inc., Detroit, in sizeable savings on materials (about $350 per mo. on flour bags), transportation (4½ cents per cwt in trucking costs) and labor (400 less in-plant-handling man-hr per mo.)

In addition, entire system occupies 1200 sq ft less space in the plant than required by previous methods — making more storage area available. This permits purchase of other ingredients in more economical bulk lots. END

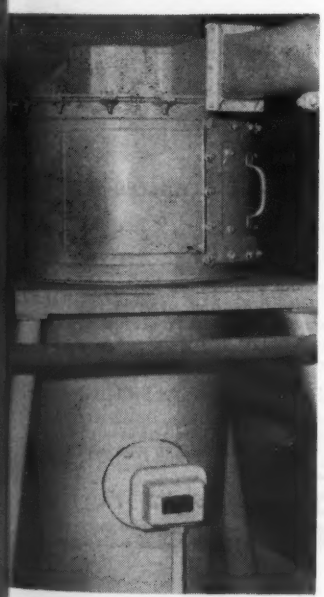
Roto-Bin-Dicator . . .

. . . is a bulk-material-level indicating and level-control device that "senses" by means of a rotating paddle extended into interior of bulk-materials bin on a coil-spring-steel flexible shaft. A low-torque, slow-speed motor rotates shaft and paddle. In operation, as material builds up to the paddle, latter stops rotating. This, in turn, stalls the motor (motor may be stalled indefinitely without damage), actuating a micro-switch controlling signals or bulk feed.

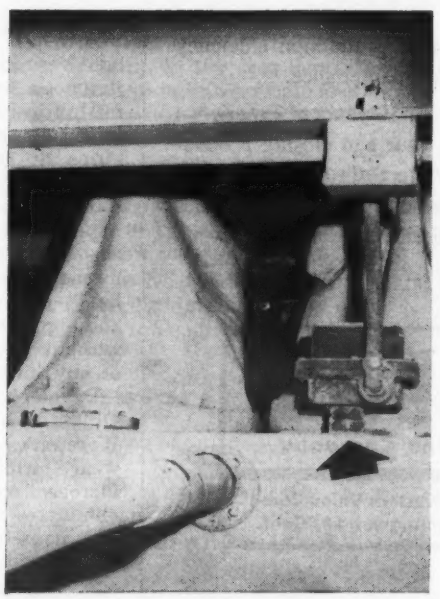




Master control panel shows graphically the position of each Roto-Bin-Dicator and related flow controls in the Awrey flour-handling system. Signal lights indicate operating status of each of the devices

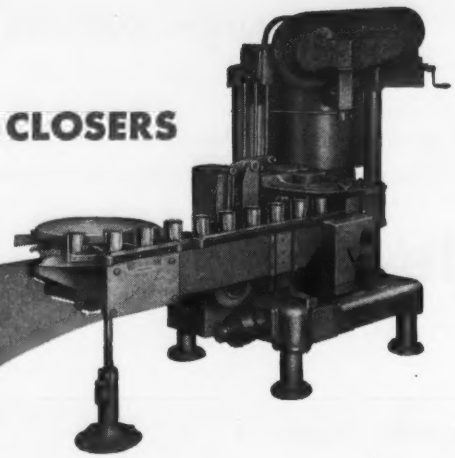


When flour level in collector hopper reaches Roto-Bin-Dicator position, an electrical impulse automatically cuts off supply of flour from the conveyor system



On in-plant use bin, Roto-Bin-Dicator mounted atop bin (arrow) adjacent to the entrance of the airveyor line, signals when bin is full

ANGELUS CAN CLOSERS



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6442 on Reader Service Slip.

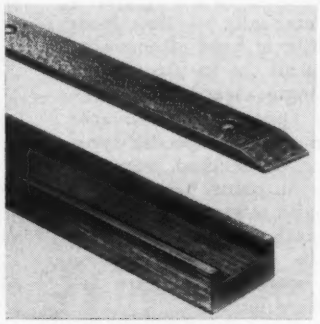
material handling

Self-lubricating wood wear strips for conveyors

Designed specifically to provide trouble-free operation

A self-lubricating wood wear strip has been designed specifically for trouble-free operation of conveying machinery currently in use or under construction.

Wear strip, which minimizes wear on stainless steel and other type belts, greatly cuts maintenance, and reduces downtime for repairs.



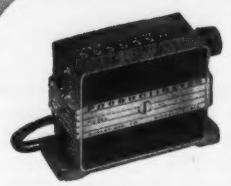
Self-lubricating wood wear strip is machined in many lengths and thicknesses. It may be bored, counterbored, slotted, grooved, tapped or rabbited to conform with mounting specifications

Wood wear strip, called POBCO, is made of impregnated hardwood. It eliminates the need for applying edible fat lubricants as well as other lubricants to ordinary wear strips at regular intervals.

Wood is classified as non-contaminating and process of impregnation prevents water absorption, guards against the inroads of mild acids and alkalis and assures adequate and continuous lubrication without mechanical adjuncts of any kind.

Developed by Paramount Oilless Bearing Co., Inc., Worcester, Mass., the wood wear strip reduces friction, increases operating speeds and eliminates tie-ups in production caused by jamming, incorrect timing, bottle breakage, can damage or damage

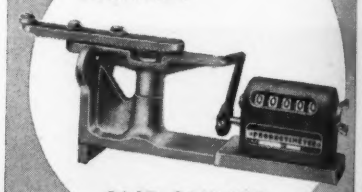
Count ALL PRODUCTION
with accurate, dependable
DURANT PRODUCTIMETERS



ELECTRIC COUNTER

HEAVY DUTY STROKE ACTION

BOTTLE AND CAN COUNTERS



CASE COUNTER

Eliminate profit-eating losses . . . Productimeters register accurate count of every unit processed . . . insure economical plant operation and maximum use of man hours.

DURANT MANUFACTURING CO.

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DURANT
COUNTING INSTRUMENTS

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to precision mechanical components of the machine itself.

Since it is strong and flexible, it may be attached at chain return drop-off points following the curvature of the original ways. Wear strips are fabricated to specifications, eliminates tie-ups in product installation.

A 6-page bulletin is available describing the use advantages of the self-lubricating wood wear strip and illustrating many typical applications.

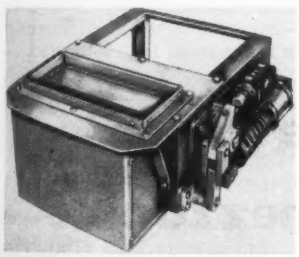
6444 on Reader Service Slip.

Feed granular substances precisely — fast or slow

Uses: Three models of Vibragate Feeder — Series G — are designed for applications requiring great precision in feeding and batching hard grain, pelletized feed and similar granular, free-flowing, non-flooding materials with particles up to ¼ in. in diam.

Features-Description: The two-speed feeders employ a unique feature which prevents clogging during the slow-feed process.

At fast speed, the flow control gate is adjusted to its fully opened position, permitting unrestricted material flow.



Ruggedly built units employ stainless steel for all parts that come in contact with material being fed

When slow or dribble flow is desired, however, a pneumatic vibrator mounted on the flow control gate is actuated. The vibrating action assures an even flow of material through the gate — precisely measured and non-clogging.

Supplier: Thayer Scale Corp., Thayer Park, Pembroke, Mass.

6445 on Reader Service Slip.

THE FMC 18 VALVE FILLER

FILLS CANS OR JARS—from 202 to 404 diameter, with a minimum number of change parts. It will handle containers from 200 to 800 tall by simple vertical adjustment of filler bowl.

HIGH SPEEDS: up to 400 cpm depending on product and container size. Chain feed, worm timer and tangential take-off contribute to smooth, gentle handling.

HANDLES A WIDE RANGE OF PRODUCTS:

Liquids and juices: including tomato juice, peach and pear nectars, pineapple-grapefruit juice drink, pineapple juice.

Syruping: such as peaches, apricots, pears, fruit cocktail, figs, cherries.

Brining: adds brine to such products as spinach, diced carrots, green beans, peas, small potatoes, dry beans, pork and beans.

HIGH ACCURACY: extraordinary open-vent gravity-type valve design permits the valve's vent tubes to *drain completely* before cans leave the machine, providing greatest accuracy and uniformity of fill at high speeds. Can-lifts give positive, automatic "No Can, No Fill" operation, reducing the problems of spillage and waste. Head space is readily adjusted.

FULL AND COMPLETE DETAILS on this highly versatile FMC Filler will be furnished promptly by your FMC representative. Write or call today.

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Why Victor Suprene Belting is your best choice for conveying—elevating —transmission

Victor Suprene is tightly woven of top-grade cotton duck, thoroughly impregnated with Victor's own exclusively developed Neoprene compound. It's this careful impregnation that produces Suprene's smooth, sanitary surface...seals the weave against small food particles... resists food acid, oils and moisture. And makes it so easy to clean with a hot water or steam wash.

Victor Suprene comes in three weights for conveying, elevating and power transmission jobs in the food industry; Style 100 in white or black for lightweight, small pulley, high performance operations...Style 25 in white for light to medium duty ...and Style 34 in black for those workhorse chores.

All three styles of all-purpose Victor Suprene Belting are available in a wide range of plies and widths. For complete specifications and prices of Victor Suprene Belting, write today for Circular 20.

1499

A COMPLETE LINE, including: Neoprene Belting • Solid Woven Belting—untreated, impregnated, coated—many widths and plies • Canvas Stitched Belting • Hycar Belting • Belting Specialties.

Victor
Balata & Textile Belting Co.
53 Park Place, New York 7 • 300-306 W. Hubbard Street, Chicago 10
Factory: Easton, Pa.

6447 on Reader Service Slip.

How to get more storage space — build a mezzanine

... and use a light-but-rugged 'walkie' to high-stack on it!

BY BUILDING a mezzanine over its cellar, Meier's Wine Cellars, Silverton, Ohio (Cincinnati suburb) nearly doubled previous glass-storage capacity.

Mezzanine structure easily supports palletized cases of glass bottles and the walkie fork truck with telescoping mast used to high-stack on the mezzanine.

Photo shows how a stand-up rider fork truck, also with telescoping mast, lifts palletloads of empty bottles to floor of mezzanine, where the lighter-weight walkie high stacker takes over. Latter's mast top (circled area) is barely visible as it goes about its task.

Walkie and rider-type high-stacking fork lift trucks by The Moto-Truc Company, 1953 E. 59th St., Cleveland 3, Ohio.

6448 on Reader Service Slip.

Flexible steel-mesh belts in food-conveying uses

New bulletin by LaPorte Mat & Mfg. Co. describes and illustrates uses of flexible steel conveyor belts in the food industry.

Belts stay flexible under extreme temperature changes —

In addition to one-by-one-in. mesh shown, other standard meshes are ½-by-1 in. and ½-by-½ in. (for small fruits, vegetables, potato chips, shrimp)

yet provide a perfectly flat surface for all types of containers.

When used on cookers, dehydraters and freezers, the belts' high rate of temperature transfer further accelerates these processes.

Open-mesh construction assures a positive drive on the sprocket, eliminating tracking problems, and simplifying sterilizing with a steam gun while in motion. It also prevents products in process from rolling off.

6449 on Reader Service Slip.

How magnetic controls automate unit conveying to any degree desired

Modular magnetic control units with great application flexibility — that open the way to full-scale conveyor line automation for many small and medium size manufacturing and warehousing operations — are introduced in six-pg Flo-Tronics, Inc. bulletin on MAG-PAC Magnetic Conveyor Controls.

The controls also are adaptable to extensive, highly complex conveying systems requiring hundreds of command or control operations. Systems can be operated from a central

Which of these features do you look for in a FOOD OR BEVERAGE HOSE?

Freedom from Odors and Taste?
Ease of Cleaning and Sterilizing?
Transparency?
Flexibility?
Long Service Life?
Wide Range of Standard Sizes?

TYGON® plastic TUBING B44-3 combines them all!

Remaining flexible throughout the full range of normal operating temperatures, Tygon plastic Tubing, Formulation B44-3, is also as clear as glass, permitting visual inspection and control of flow.

Non-contaminating and non-toxic, Tygon Tubing B44-3 neither imparts nor absorbs taste or odors, is safe with even the most flavor-sensitive products.* Because of its smooth, hard bore, Tygon Tubing is easily cleaned, can be sterilized with steam (open end method) or bactericides.

Tygon Tubing is non-aging, highly resistant to abrasion, and has a flex life 10 to 12 times greater than rubber. More than 65 standard sizes, up to 4" I.D., are available in continuous lengths.

*For processed milk and milk products, use Formulation B44-4X.

See why Tygon Tubing, Formulation B44-3, is almost universally the preferred plastic for handling foods and beverages. Get complete information — write today for your free copy of Bulletin T-100.

443-F-3

PLASTICS & SYNTHETICS DIVISION

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AKRON 9, OHIO

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Rugged...Dependable...Practical

Commercial Aluminum Ware FOR HANDLING BULK FOODS!

Ease of handling, storing and cleaning . . . maximum utensil life! Get them all with Commercial aluminum food-handling equipment. Designed to meet the practical requirements of meat and food processors, Commercial utensils are built of extra heavy aluminum with double strength at critical wear points . . . rounded corners and closed beaded edges for maximum sanitation . . . large, roomy handles for quick, easy moving and stacking. Bright aluminum finish is acid, stain, abrasion and corrosion resistant for dependable, long-life service. You get long run economy *plus* lower initial cost when you buy Commercial aluminum food-handling equipment!

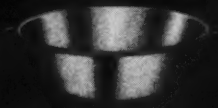
Write today for information and prices.

HEAVY DUTY STOCK POT
For extra heavy usage. Heavy steel handles. Available with faucet and strainer. 12 sizes, up to 100 qt. capacity.

STACKING INGREDIENT PAILS
Stack conveniently for efficient storage. Long wearing service. Three sizes, up to 36 qt. capacity.

STACKING BAIN MARIES
Excellent for replacement of crocks. Save valuable storage space. Alumilite finish. Three sizes, up to 20 qt. capacity.

UTILITY/DISHPAN
Alumilite finish Sturdy, versatile, practical. Five sizes up to 60 qt. capacity.



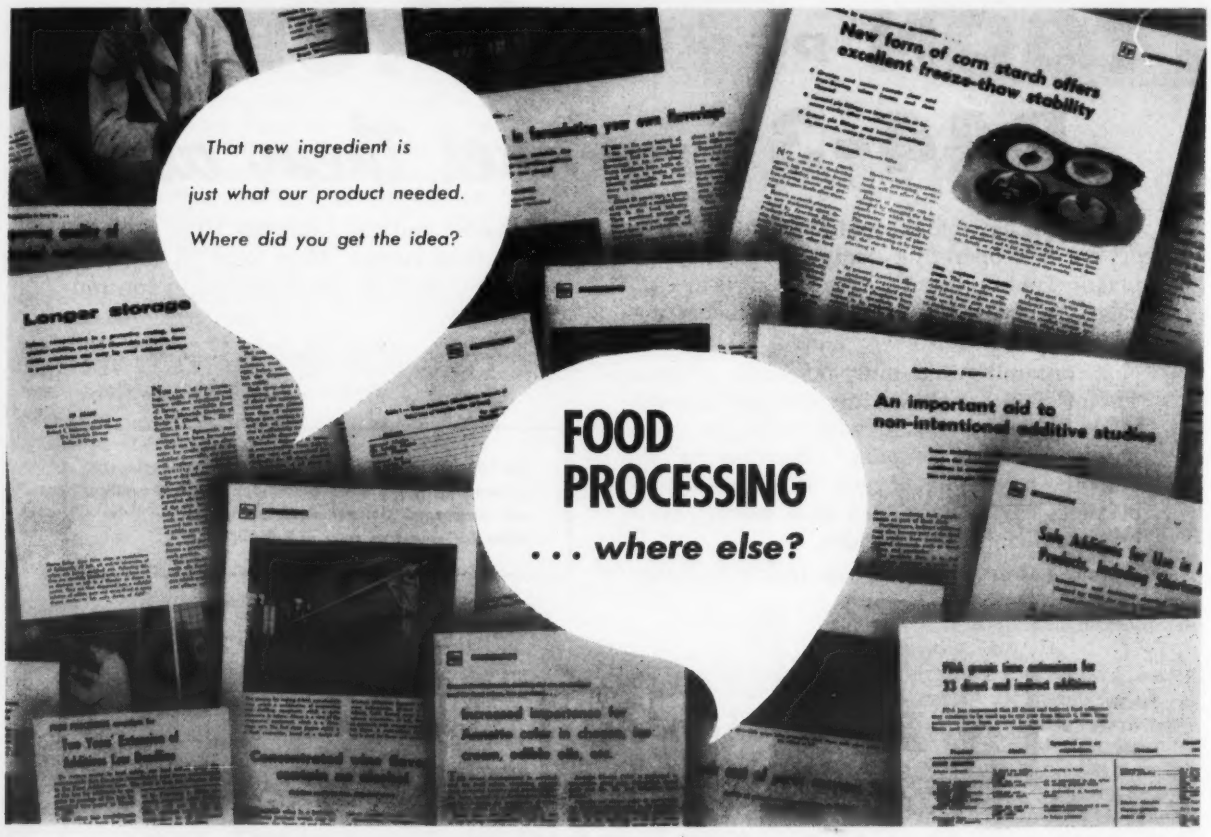
MEAT TRIM TUBS
Built to take it. Ideal for meat trimmings, storage, etc. Two sizes 20 and 41 qt. capacity.

DOLLY
For handling extra heavy tubs and containers. Available in three sizes; 21" diameter illustrated.

Also Available: LARGE MIXING BOWLS—Heavy steel handles. Alumilite finish. Five sizes, up to 80 qt. capacity. PAILS—Versatile, rugged, practical. 4 sizes, up to 22 qt. capacity.

HARLOW C. STAHL COMPANY, 1373 E. JEFFERSON AVE., DETROIT 7, MICH.

6451 on Reader Service Slip.


That new ingredient is just what our product needed. Where did you get the idea?
FOOD PROCESSING
. . . where else?
New form of corn starch offers excellent freeze-thaw stability
Longer storage
An important aid to non-intentional additive studies

"dispatcher" unit, or by remote punch card or tape command.

With appropriate combination of interchangeable basic control units, any conveyor system for packages, drums, tote boxes, pallets, etc., can be pre-set to automatically direct to selected stations, unload or load when ready, follow various routes, give priority and carry out many similar functions.

Automatic item identification and selective interception is accomplished through magnetic code patterns "marked" via a magnetic marker on a magnetic tally plate associated with each unit conveyed.

Coded commands can be provided to activate any relays needed at the various intermediate stations to carry out the function desired.

Conveyor lines can be horizontal, vertical or in combinations; they can run between floors, or even between buildings.

MAG-PAC units can be installed on existing conveyor systems or new installations, require only standard electrical power supply, need no interwiring between stations.

6452 on Reader Service Slip.

Rubber-tired casters roll easily under heavy loads

Move one-third easier than conventional type

New dual-wheel swivel casters provide all the advantages of conventional rubber-tired wheels — including quietness, shock-absorption, floor-surface protection — but have extra advantage of rolling easily under heavy loads.

Smooth functioning is due both to construction of the wheel components, and to the over-all caster design.

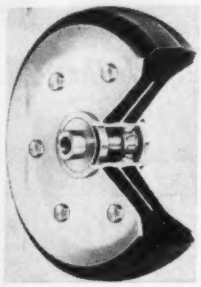
Each 10-in.-diam "self-energizing" wheel consists of hub section, two side discs, tension bolts and Timken sealed bearings.

Rubber stock is bonded to the hub and side discs. After curing, bolts are inserted through wheel and tightened.

Under load, internal rubber

is displaced outward, "inflating" tread and providing resistance to further displacement under load. Tread still is soft and resilient, but will not flatten at floor contact to offer resistance to swivel action and to obstruct free movement.

Caster swivel assembly, of Timken bearing construction, is built to reduce the "scrub"

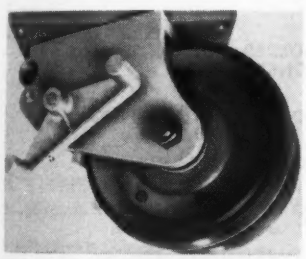


Cutaway of wheel shows how rubber is bolted to hub and to inner surfaces of side discs, then further reinforced by bolts

during swivelling action, and materially eliminates inertia through the caster swivel.

As result, towline or manual starting effort is minimized, and loads are moved one-third easier than with conventional wheels — in many cases permitting one man to roll a loaded truck that previously required two or three men.

Caster is rated at 2000 lb capacity per caster; its use



Dual-wheeled caster features step-down brake that is double-handled — a light down kick stroke locks or releases

allows 8000 lb on four such casters to be moved manually.

For operation in oils, fats, high temperatures, etc., caster wheels have Neoprene tread.

Supplier: Roll Rite Corp., 801 Jefferson St., Oakland 19, Calif.

6453 on Reader Service Slip.

HYSTER

Monotrol for fast, safe handling —

Only

HYSTER® has it!

New Hyster cushion tire lift trucks with Monotrol control system—unbeatable for in-process *and* warehouse handling.

Right foot controls power—shifting. Left foot controls truck inching—braking. Driver's hands free for steering and load control.

Functional design—shortest turning radius—power steering. Easiest truck to service and maintain.

Call your Hyster dealer, or write for literature.

INDUSTRIAL TRUCK DIVISION—Lift trucks, mobile cranes, straddle carriers
TRACTOR EQUIPMENT DIVISION—Construction and logging equipment
MARTIN TRAILER DIVISION—Heavy machinery hauling trailers
INTERNATIONAL DIVISION—Overseas manufacturing, sales and service
Manufactured in: Portland, Oregon (Home Office) • Danville, Ill. • Peoria, Ill. • Kewanee, Ill.
Australia • Brazil • England • France • The Netherlands • Scotland • Union of South Africa

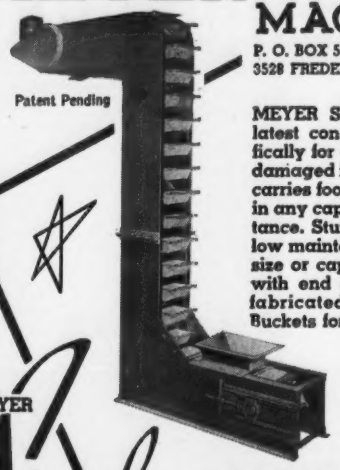
NEWEST TRUCKS - NO INVESTMENT — CUSTOM LEASING PLAN — CALL YOUR HYSTER DEALER

HYSTER COMPANY
INDUSTRIAL TRUCK DIVISION
P. O. Box 847 • Danville, Illinois

6454 on Reader Service Slip.

MEYER MACHINE COMPANY

P. O. BOX 5096 • • • PEnshing 4-5151
3528 FREDERICKSBURG RD. • SAN ANTONIO 1, TEXAS



MEYER SIMPLEX CONVEYING ELEVATORS are the latest concept in materials handling. Designed specifically for conveying materials that are easily broken or damaged in handling, the SIMPLEX gently and efficiently carries food products, small metal parts, bottle caps, etc., in any capacity, to any desired vertical or horizontal distance. Sturdily built for Round-the-Clock operation and low maintenance, the SIMPLEX can be furnished in any size or capacity to meet your specific needs. Available with end or multiple side discharges and with either fabricated Stainless Steel or cast Aluminum alloy Buckets for sanitation and long life.

MEYER *Simplex* CONVEYING ELEVATORS

- SAFE
- DURABLE
- SANITARY

WRITE FOR BULLETIN 910

Available with

VIBRA-FLEX FEEDERS and HOPPERS . .
TO ASSURE A UNIFORM FLOW OF MATERIAL

The built-in Adjustable VIBRA-FLEX Feeder, above, is used when SIMPLEX is fed from a holding bin. The Portable VIBRA-FLEX Feeder and Hopper, left, is used when manual feeding is desired. Feeding rate on both are adjustable.

6455 on Reader Service Slip.

INCREASE PROFITS!
CUT HANDLING COSTS!

PUT YOUR FROZEN FOOD PROCESSING ON WHEELS

Midwest
ROLL-AWAY TRUCKS

TRUCK SIZE
19¼" x 29" x 55"

. . . roll easily on wide tread 4" composition wheels.

. . . speed movement of packaged meats and other foods from counter or into cold room for storage.

. . . save time, plus labor and food handling expense.

. . . hold 7 large trays or 14 half-size trays, electro-plated to prevent discoloring of packages.

. . . tray sizes: 17" x 28½" x 4", 17" x 28½" x 5" or 17" x 14½" x 3½". Every joint welded . . . no open ends to catch on trucks, doors or other trays.

WRITE FOR CATALOG AND PRICES

MIDWEST METAL STAMPING CO. • Phone 60 • KELLOGG, IOWA

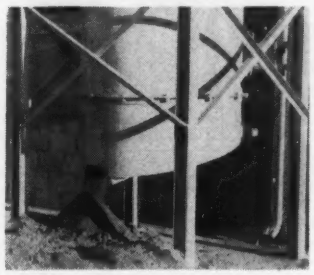
6456 on Reader Service Slip.

material handling

Moist sand pours from 'live' bin like water

Moist sand has pronounced bridging tendencies, even in conventional hoppers.

To demonstrate the effectiveness of the "live bin" agitation principle, a 10-ton test bin was built so as to aggravate the problem. The tall, narrow cylinder had a bottom



Moist sand flowed freely from agitated test bin, despite nearly flat bottom, small opening

slope of only 10 degrees and an outlet of only three-by-ten in. Bin rested on four heavy-duty rubber mountings.

Notwithstanding the adverse design features, moist sand ran out of the agitated bin like water when a three-hp motor vibrated the bin.

Typical of the difficult-to-handle food products successfully being run with Vibra Screw live bins are moist synthetic sugars (as discharged from a centrifuge) and soft brown sugar.

Supplier: Vibra Screw Feeders, Inc., 156 Huron Ave., Clifton, N.J.

6457 on Reader Service Slip.

Tells all about line of pneumatic equipment

Major components used in Young Machinery Company pneumatic systems, and a dozen system variations involving negative- and positive-pressure systems, closed-circuit systems and a variety of special applications are described and illustrated in eight-pg Bulletin P-259-A.

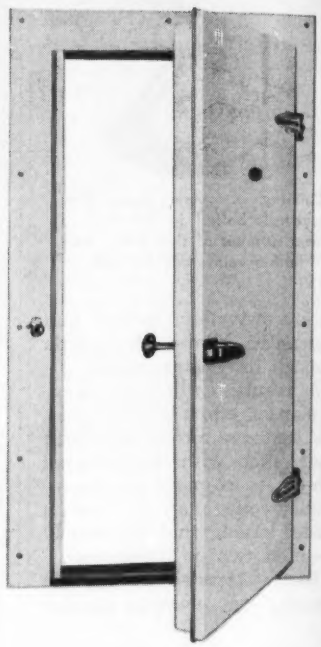
Also included are several installation photographs with specific application data.

6458 on Reader Service Slip.

Introducing

VIROQUA
fiberglass
COOLER DOORS

Formerly Walker Doors



MOLDED FIBERGLASS CONSTRUCTION
seals moisture out.

NO RUST OR WARPING
can't corrode or wear.

LIGHT IN WEIGHT
less than one-third other doors.

NO PAINT, NO UPKEEP
cuts maintenance cost.

COMPETITIVELY PRICED
costs no more for the best.

MANY MODELS AND SIZES
cooler, freezer and reach in doors.

Molded fiberglass cooler and freezer doors designed to fit today's refrigeration needs. A truly revolutionary product development. Write today for literature.

SELECT DISTRIBUTOR TERRITORIES OPEN. WRITE FOR COMPLETE INFORMATION

Viroqua Doors
Viroqua, Wisconsin

6459 on Reader Service Slip.

Association News

National Assn. of Margarine Manufacturers

has elected as board chairman Russell F. Schober, manager, General Margarine Dept., Swift and Co., Chicago.

Dairy Society International

has promoted to the position of assistant administrator W. P. Phillipsen. Before joining the DSI staff in 1957, he had been director of American Dairy Assn. in Wisconsin.

Tea Council of the U.S.A., Inc.

has elected as chairman Edward C. Parker, president of Tetley Tea Company, Inc. Newly elected to the board was W. Gardner Barker, president of Thomas J. Lipton, Inc., and head of the Tea Assn.

Corn Industries Research Foundation

re-elected Frank K. Greenwall as president and reinstalled all other incumbent officers for a term of one year. Also included in the re-elections are William T. Brady and A. E. Staley, Jr., as vice presidents; Floyd J. Hosking, executive vice president and treasurer; William J. Hoover, secretary and manager of technical services; Dr. John T. Goodwin, Jr. technical director; Robert D. McMillen, public relations manager; and Michael F. Markel, counsel.

N. Y. Academy of Sciences

has awarded a fellowship in the Academy to Dr. John T. Goodwin, Jr., technical director of Corn Industries Research Foundation, Inc. The award was given in recognition of Dr. Goodwin's accomplishments in science in his present post as well as previously with Midwest Research Institute of Kansas City, where he was engaged in research in silicones. The award is presented to a member of the Academy who has attained "outstanding recognition for scientific achievement or for the promotion of science."

LOADED WITH NEWS—this Mack B-61T Model easily maintains top legal speeds, faithfully delivers its cargo of daily newspapers throughout a large Midwest area. Its Thermodyne diesel dependability rolls up 5,000 trouble-free miles every month. Other Mack tractors and platform trucks speed newspapers and magazines to metropolitan Chicago news dealers.

PERISHABLE—handle with Macks!

Nothing's as stale as yesterday's news. That's why "high-ball" delivery of daily newspapers is a must . . . and why the Chas. Levy Circulating Company of Chicago, the Midwest's largest newspaper and magazine distributor, is switching to Macks. Macks give the top legal speeds needed for fast runs and the everyday dependability essential to this five-state operation.

No matter what the weather—and it varies from 25° below to 105° above—or the traffic conditions, the company's Macks operate faultlessly with no appreciable downtime. This means that news dealers and distributors in five states as well as in Chicago's outlying suburbs are assured of dependable, regular, on-time delivery.

For the same reasons you'll find more and more haulers of "perishable" commodities joining the trend to Mack trucks. Many are specifying the added advantages of Mack-built, world-famous Thermodyne® diesel power, too—among them, lowest fuel and maintenance costs . . . complete reliability . . . and long, trouble-free operating life.

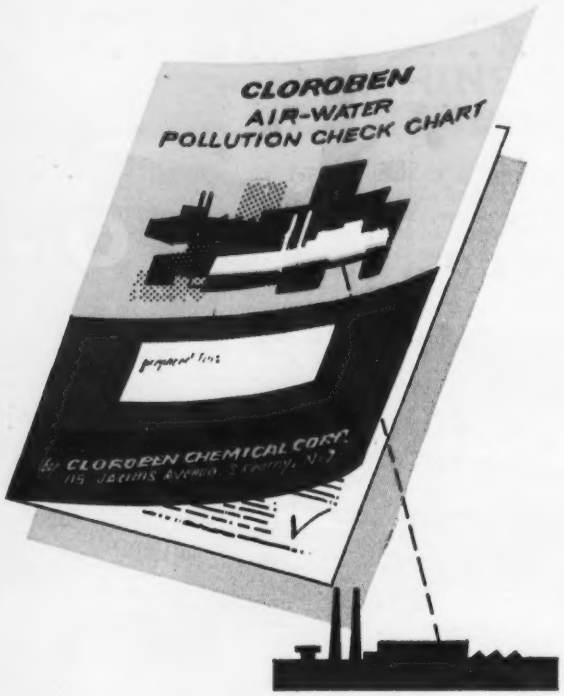
Whatever you haul, wherever you haul—your Mack branch or distributor has the exact Mack truck or tractor, diesel or gasoline-powered, to deliver your cargoes safely and quickly. Have your Mack representative supply you with the names of other successful Mack operators, and stack their operating gains against your own. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

7878

MACK
FIRST NAME FOR
TRUCKS

MACK for over 8 straight years **NO. 1** by far in sales of diesel trucks

6460 on Reader Service Slip.



YOUR PLANT'S PROBLEMS MAY BE ON THIS CLOROBEN AIR-WATER POLLUTION CHART...

Chances are that the simple application of Cloroben can save you real money while making your plant a good community neighbor—fast!

Cloroben is a unique chemical emulsion that goes to work on *all* your pollution problems:

1 — **Kills foul odor in lagoons, filters, drainage ditches.**
2 — **Inhibits odor-causing bacteria but does not adversely affect digestive bacteria.**
3 — **Dissolves grease and slime accumulations.**
4 — **Prevents septicity by stabilizing plant wastes.**
5 — **Keeps grease traps, drains and waste lines clear and odor-free.**
6 — **Gets rid of many obnoxious stack gases when used as a scrubbing agent in food processing.**

Everywhere grease accumulates and odor forms, Cloroben controls these problems . . . prevents their recurrence with preventive maintenance.

FREE OFFER: A "Cloroben Air-Water Pollution Problem Chart" to help you survey your plant and eliminate trouble—even before it starts. Write for your copy today to Cloroben Chemical Corp., 115 Jacobus Ave., S. Kearny, N. J.

CLOROBEN

6461 on Reader Service Slip.

material handling

Summarizes 1960 laws on highway transport

Federal and state legislative developments related to highway transportation are assembled and condensed in 10-page booklet available from National Highway Users Conference.

Federal legislation is summarized as it deals with highways, with taxes and motor carriers and with regulatory measures.

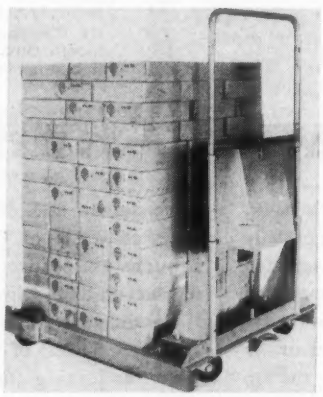
Major topics pertaining to state legislation include highway taxation and finance, uniform laws and motor vehicle regulation and highway laws involving advertising along highways, utility reimbursement, parking facilities, etc.

Final page presents a "legislative information chart" providing state-by-state legislature schedules for 1961 and 1962, with an extensive addendum detailing local legislative particulars.

6462 on Reader Service Slip.

In-plant truck adaptable to handling changes

Features: Basic frame of new low-cost universal pallet truck is designed so that truck can be utilized as is, or, by addition of various accessories, can be modified to meet most requirements. This eliminates need to replace trucks due to changes in warehousing or in order-filling methods.



Versatility of truck has not yet been completely explored

Description: Extremely low

Famous for protection ...

The super-lubricating film of--

ORANGE SOLID OIL

is famous for protecting machinery

Lasts two to four times as long as ordinary greases Keeps production--UP! Maintenance repairs--DOWN! Saves bearings, material, power, time...and...labor

If you've ever watched a welder at work--you know why he wears his familiar mask. To thousands of spectators, that mask is a famous symbol of protection. For more than fifty years Orange Solid Oil has also been famous--for protecting vital equipment--with its super lubricating, long lasting film. And because it has been improved, Orange Solid Oil now has increased lubricating, sealing, waterproof and rust protection properties. In addition, it has greater clarity, brilliance, and transparency. Today, more than ever, Orange Solid Oil is used and recommended by leading manufacturers of dairy, cheese, creamery, ice cream, and food equipment.

1--Pure, unadulterated petroleum solidified oil.
2--Practically odorless, tasteless, and transparent.
3--Won't turn rancid--free of animal and vegetable fat.
4--Cannot pit bearings--contains no alkalis.
5--Non-corrosive--will not gum, cake, dry, or harden.
6--Contains no fillers or abrasive of any kind.
7--For all Alemite and Zerk fittings and grease cups.

To minimize production down-time...reduce maintenance costs...and...keep your output at top level--lubricate with famous, time-tested, job-proved Orange Solid Oil.

Over 200 leading distributors from Maine to California stock Orange Solid Oil. Packed in 4 oz. tubes...and...1, 10, 25, 100, 225, and 375 pound containers. Quick delivery from your local distributor. If he can't fill your order--phone, wire, or write for name of your nearest source of supply.

For additional protection use special purpose-- ORANGE HOMOGENIZER OIL NO. 50
• Refined from aircraft stock • Does not foam • Moisture resistant • Will not form residues or sludges.

ORANGE MULTI-PURPOSE LUBRICANT--ideal for small industries. One inch graduated filling spout perfect for lubricating electric motors, other appliances. 8 oz. tubes, packed 12 to the carton.

Famous Lubricants Inc.
Phone--BOulevard 8-2555
124-132 West 47th Street • Chicago 9, Illinois

6463 on Reader Service Slip.

carriage permits maximum pallet-load height. Angles are provided in the heavy-duty steel frame for carrying maximum load of 4000 lb on standard, winged-type or take-it or-leave-it pallets having dimensions varying from 36 by 40 in. to 48 by 40 in.

Truck can be tied into a towveyor system by means of a drop-pin accessory, or into an overhead conveyor system by means of a chain hook. Towbar hitch can be provided for forming a train of loaded pallet trucks.

Hydraulic accessories can be added for raising and lowering loaded pallets.

Supplier: Lathrop Paulson Co., 2459 W. 48th St., Chicago 32, Illinois.

6464 on Reader Service Slip.

How the 'right' lift trucks can cut handling costs

Eighty-page Bulletin 5025 of Automatic Transportation Company — "Handbook of Cost Cutting Materials Handling Ideas" — details new trends in material handling resulting from new equipment that can "enlarge" a warehouse up to 40 per cent, without a dollar spent for construction.

Under section devoted to current material handling problems, attention is given to the pros and cons of narrow vs. wide aisles, walkies vs. rider-type trucks, specials vs. standard trucks, pallet vs. palletless handling and how to select the right truck for the job.

Later sections consider how to analyze material handling flow in a plant, provide usable flow charts as well as truck-battery calculator charts for selecting the correct battery.

Literature concludes with case histories of proven cost-cutting truck applications.

6465 on Reader Service Slip.

There's a storehouse of information offered in technical literature. See page 175.

LET YOUR CARRIER SPECIALIST

FILL THIS GAP... EFFICIENTLY

FOR EXAMPLE, IF YOU'RE FACED WITH THE PROBLEM OF MOVING MATERIALS FROM STORAGE TO PROCESSING EQUIPMENT...need accurate "metering" of flow rates...and want to reduce processing costs, your Carrier Vibrating Equipment Specialist can help you provide the efficient solution. He can show you how you can get substantial power savings...step up capacity...get the operating flexibility and efficiency that cut over-all costs.

Depending upon your operation and type of materials involved, he can show you how you can combine two or more steps into one cost-cutting operation... move and dewater or blend, separate, agglomerate, heat, cool or dry.

Why not have your Carrier Specialist study your operations with a view to reducing handling costs while increasing over-all efficiency. Remember, Carrier does more than just build equipment...we provide the specialized service that solves problems of moving and processing materials efficiently.

Call him or write Carrier Division of CHAIN Belt Company, 231 N. Jackson St., Louisville 2, Kentucky.

FOR ECONOMICAL MATERIALS MOVING
SEPARATING • FEEDING • DRYING • DEWATERING • COOLING
QUENCHING • COATING • DISTRIBUTING • ELEVATING

CARRIER
NATURAL FREQUENCY
VIBRATING EQUIPMENT

6466 on Reader Service Slip.

SELECTROL® Automatic CHECKWEIGHER

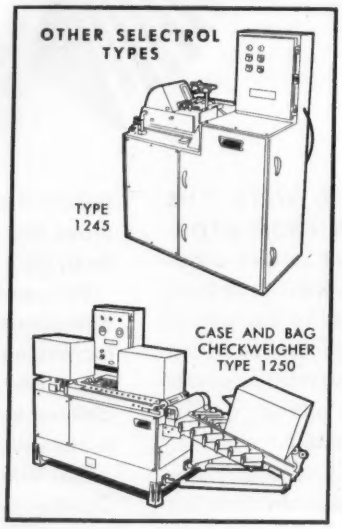
MODEL 1206

Latest electronic controls
New engineering features
New compact size

This new Selectrol checkweigher automatically weighs, classifies and sorts at speeds up to 120 items per minute, depending on size and weight of object. Rejection accuracy is 2/10 of one percent of the weight of the commodity at maximum speed.

New Selectrol features include compact size that requires minimum space in a conveyor line . . . and simplified circuits. Electrical controls are mounted above the conveyor line for easy accessibility.

Selectrols are made by Exact Weight, a leading manufacturer of job-engineered scales for 45 years with experience gained through hundreds of checkweighing installations during the past 18 years. For complete details, write for Bulletin 3377.



THE EXACT WEIGHT SCALE CO.

909 W. FIFTH AVE., COLUMBUS 8, OHIO
In Canada: 5 Six Points Road, Toronto 18, Ont.

Exact Weight SCALES

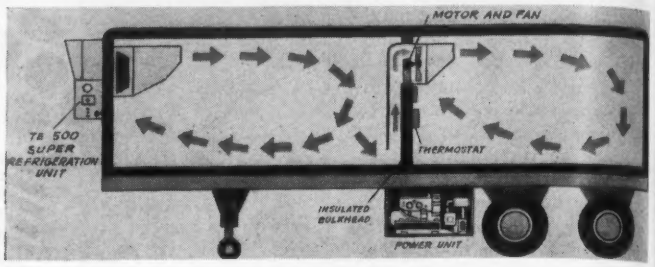
Sales and Service Coast to Coast

Find us in your local "Yellow Pages"

BETTER QUALITY CONTROL . . . BETTER COST CONTROL

6467 on Reader Service Slip.

Thermostatically controlled fan at top draws upon colder air in forward chamber for its cooling



Simultaneously refrigerate, cool two-compartment trailer — *from one source*

NEW DUAL-TEMPERATURE accessory — an electric motor driven, high-capacity 16-in. fan and thermostat — greatly expands the versatility of all Arctic Traveler all-electric, hermetically sealed, mechanical refrigeration units.

Thermostatically controlled fan draws air from the forward colder compartment (down to minus 20 F) to provide cool air for the warmer compartment in back — all from one refrigeration unit.

When the desired temperature is reached in back, fan automatically stops. When more cooling is called for by thermostat, fan comes on again.

When fan is off, a simple system of ducts prevents convective air currents from traveling from the colder chamber to the warmer chamber.

Located on the front of the separating bulkhead (the "cold" side), are two identical ducts which open near the floor of the forward compartment, then run up and through the bulkhead into the back compartment.

When fan is on, it draws its supply of air through one of these ducts, and the other duct serves as a return air vent.

When fan is off, both ducts together, following a basic rule of physics, act as an air lock to check circulation of air between the compartments.

On fixed bulkheads, dual-temperature assembly is mounted on wall and connected directly to mechanical refrigeration engine-generator unit beneath body or trailer floor. Movable bulkheads are accommodated by a spring-coiled extension cord.

Assembly is supplied in kit form. Duct work is available, although it usually is more expedient to acquire this locally.

Supplier: American Manufacturing Co., P.O. Box 989, Montgomery, Ala.

6468 on Reader Service Slip.

Totally enclosed conveyors vibrate bulk without dust

Features: Line of totally enclosed, air-powered vibrating conveyors that eliminate contamination and dust when moving bulk materials use no motors, eccentrics, belts, bearings, gears or spiral screws — thus cutting maintenance to a minimum.

Vibratory drive, air-cushioned for quiet operation, powers the aluminum tubular conveyor which carries the material. Steady, rapid vibrations carry even the most brittle materials without chipping or breakage.

Description: Flow is started and stopped by a quick-acting

Hertz Customer—Beatrice Foods Company, Chicago, Ill.

HERTZ gets you out of the Truck Business . . . and back into the Food Business!

Every hour spent on truck problems and administrative details is an hour *better* spent in promoting your own business. This is why more and more companies today are switching to Hertz Truck Lease Service!

Hertz pays cash for your present trucks. Then you take your choice of new GMC, Chevrolet or other famous make trucks. Or your own trucks can be reconditioned and leased back to you. Instead of many separate bills, you pay just one check per week —and that covers everything except the driver.

Hertz Truck Lease Service includes complete truck maintenance, plus all administrative details such as licensing, insurance, garaging, emergency road service, painting and lettering of trucks, and much more!

The service is *flexible*—trucks are custom-engineered, for example, to suit any kind of business. Should a truck be tied up for repairs, Hertz supplies a replacement. Or if extra trucks are needed, for peak periods, Hertz supplies them immediately. Get out of the truck business today! Call your local Hertz Truck Lease office for more information or write for booklet—"How to Get Out of the Truck Business."

No investment . . . no upkeep

LEASE HERTZ TRUCKS

HERTZ ALSO RENTS TRUCKS BY THE HOUR, DAY OR WEEK

HERTZ TRUCK LEASE, Dept. N-4
660 Madison Avenue, New York 21, N. Y.
Please send copy of booklet—"How to Get Out of the Truck Business" to:

NAME_____

POSITION IN COMPANY_____

COMPANY_____

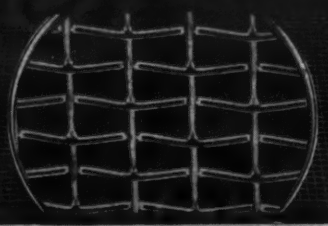
ADDRESS_____

CITY_____ ZONE_____ STATE_____

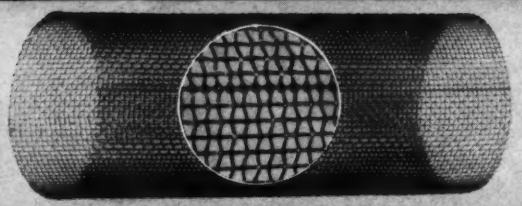
For more information on product at right, circle 6469 see information request blank opposite last page.

Need Wire Cloth Specials? Call *Cambridge*

BRAZED

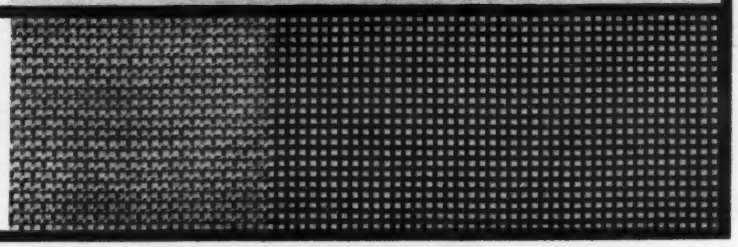


SEAMLESS



TEFLON* COATED

Right Side Coated



*Reg. T.M. of DuPont Company

These are just 3 of the many wire cloth specialties Cambridge can produce for you—no matter how large or small a quantity you need. Or, if you have an extra-special problem, there's an expert on hand to discuss your special needs . . . your Cambridge Field Engineer. He can show you how to get the results you want—in the quickest possible time at the lowest possible cost.

Your Cambridge Field Engineer is listed in the Yellow Pages under "Wire Cloth." Call on him at any time. Or, write for illustrated, 120-page catalog.

If Your Problem Involves Standard Metals or Alloys...

we make wire cloth from any metal or alloy that can be drawn into wire . . . in nine basic weaves, and with accurate mesh count and mesh size. Ask about immediate deliveries from our enormous stocks of the most frequently used types of cloth in a wide range of mesh sizes.

Refer to our technical data sheets in CHEMICAL ENGINEERING CATALOG, Pages 185

THE CAMBRIDGE WIRE CLOTH CO.

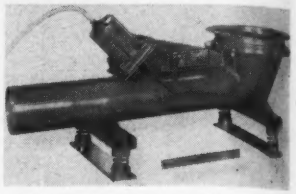
DEPARTMENT H • CAMBRIDGE 4, MARYLAND

Manufacturers of Metal-Mesh Conveyor Belts, Flat Wire Conveyor Belts, Wire Cloth, Wire Cloth Fabrications and Gripper® Metal-Mesh Slings.

6470 on Reader Service Slip.

valve that can be regulated by adjusting the air-supply pressure (between 10 and 100 lb).

Mounting the drive unit above the conveyor (as shown) permits conveyor to be installed as low as six in. above the floor. Four coil springs provide support and isolate vibration from surrounding structures.



This model — three ft long, and with a six-in.-diam conveyor tube — carries aluminum pellets with a density of 65 lb per cu ft from a bin to a blower system at rate of 20 tons per hr

The supporting springs never need tuning, and eliminate channel bases, counter-balancing iron weights and cushion blocks.

Conveyors up to 20 ft long may be powered by a single unit; longer units are possible by telescoping individual conveyors in a series. Vibrating conveyors may also hang overhead, with the vibratory unit located beneath the conveyor tube.

The entire unit can be cleaned with common cleaning substances without damage to conveyor or vibratory unit. The one moving part — a piston inside the cylinder — is automatically lubricated.

Supplier: The Cleveland Vibrator Co., 2828 Clinton Ave., Cleveland 13, Ohio.

6471 on Reader Service Slip.

How to choose conveyor belts for foods, packages

Do small packages now slip down inclines? Are hot, greasy foods ruining your present belt? Is too much moisture rotting belts or causing mildew? Do dirty belts make inspection difficult?

A guide to correct selection of conveyor belts for food and package-handling applications is included in new, 12-page

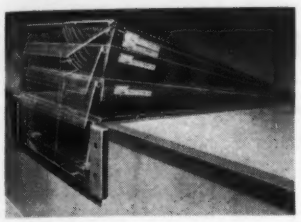
brochure, "Conveyor Belt Selector," published by B. F. Goodrich Industrial Products Co., a division of The B. F. Goodrich Co.

Selector chart rates belts for such characteristics as resistance to abrasion, high temperatures and oil and grease. Featured in section of food-handling belts are the company's exclusive Koroseal and Green Pack belt constructions.

6472 on Reader Service Slip.

Dockboard automatically extends, locks, retracts

Features-Description: New automatic lip-actuating feature keeps lip in downward, protected position until dockboard has raised high enough to swing lip over truck bed.



Automatic lip-actuating feature increases safety and ease of operation of dockboard

The multiple-exposure photograph shows the unit first in its normal dock-level or cross-traffic position, with lip in its safety position, protected behind steel-faced, rubber-backed bumpers (lower).

When unit is released from level position by the dock attendant, the precision counterbalance raises the dockboard, with lip in protected position until it swings over truck bed.

The three-second adjustment is completed by stepping on the dockboard, lowering it to working position, where it automatically locks in firm contact with the truck bed.

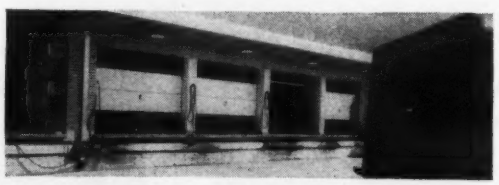
Lip can be extended or retracted at any time, and retracts automatically when truck pulls out.

Supplier: Adjust-A-Lip dockboard by The Kelley Co., 2129 W. Mill Rd., Milwaukee 9, Wis.

6473 on Reader Service Slip.

INCREASE DOCK-LOADING CAPACITY – SAVE SPACE
with Barber-Colman COOLERdoors

add extra efficiency, extra convenience to your processing and loading areas with these new, first practical roll-up doors for coolers! They permit working openings twice as large as sliding or swinging doors, yet require far less operating space!



Spacesaving, standard COOLERdoors provide the performance-tested flexibility of custom-insulated (styrofoam or polyurethane) Weather-King Flush sections—to maintain 34° to 38° F temperatures. Specially tempered 7/32" facings with high impact strength resist scuffing and bumping. Vapor-sealed and furnished with 2-coat factory prime paint. Optional section facings of 26 ga. galvanized steel, stainless steel and fiberglas available.

Barber-Colman's exclusive, fully gasketed Cam Action insures outstanding airtight seal—zero (0) air leakage at 45 mph wind velocity (and test rated up to 122 mph wind velocity)—yet allows smooth, quiet opening and closing without binding or sticking.

Custom-designed, sold and serviced by Barber-Colman . . . manufacturers of highest quality overhead door equipment for controlled temperatures and relative humidity conditions—for over 30 years. Complete choice of manual or electric operation.

Your Barber-Colman door specialist (see yellow or white pages) is specially trained to help you plan for space-controlled savings in new and existing dairy and food processing plants. Phone him today, or write.

THE MARK OF QUALITY
BARBER COLMAN

BARBER-COLMAN COMPANY Dept. AM14, Rockford, Illinois

6474 on Reader Service Slip.

Conveys more ON IT

(FOR A LONGER TIME AT LESS COST)

because there's more IN IT!

GLOBE

SOLID WOVEN COTTON BELTING

There's a half-century of experience and continuing research in every Globe Woven Cotton Belt. Firmly woven from the highest quality yarns into compact continuous uniformity, the construction eliminates ply separation and excessive stretch. High tensile strength, maximum flexibility and smooth surface is assured. 2 to 8 plies, widths up to 96".

As industry's most versatile belt, it is also available with special coatings and impregnating compounds including P.V.C., Hycar, Plascell, Cellulose, Neoprene, Wax, Silicones, Heat and Fire Resistants or Waterproofing.

Write for free samples and literature.

NEW! WRITE FOR 20-PAGE DATA BOOK . . . FREE

Ask your Industrial Distributor for Globe Belting.

GLOBE WOVEN BELTING CO., INC.

1400 CLINTON ST. • BUFFALO 6, NEW YORK

Walters-Belting Industries, Inc. Cromwell, Conn.
Endless Belt Division of Globe Woven Belting Co., Inc.

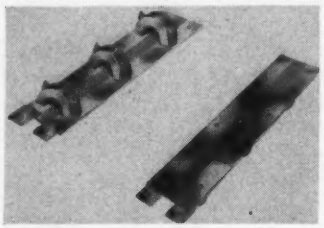
6475 on Reader Service Slip.

material handling

Magnetic bed sections for 'self-built' conveyors

Uses: "Magniveyor" magnetic bed sections — for conveying cans horizontally, vertically and at all angels — are intended for companies which prefer to design and build completed magnetic conveyors in their own shops.

Features-Description: Full, flat, polished face of section, acting as conveyor bed, elimi-



Magnetic bed sections are particularly adapted to automated systems

nates need for a stainless steel wear plate, and effects a saving of approximately $4 per ft of conveyor length.

Sections are available in standard increments — single, double and triple widths — with connecting curved transition pieces for direction change.

Supplier: Magnetic Engineering and Manufacturing Co., 840 Van Houten Ave., Clifton, N.J.

6476 on Reader Service Slip.

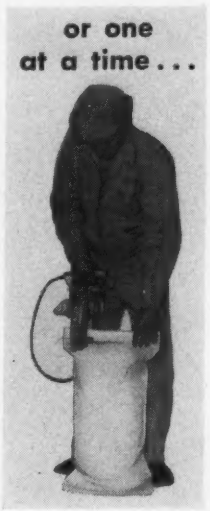
Aid in evaluating daily, annual truck performance

Truck cost record books, and forms for driver daily reports, to assist over-the-road truck users in evaluating performance of their equipment are offered by the motor truck division of International Harvester Co.

Twenty-pg truck cost record book — Form AD-20 — allows an accurate record to be kept of all fixed, operating and maintenance charges against one truck for one full yr.

The one-pg driver daily report — Form AD-26 — which may be used in conjunction with the cost record book,

On production line . . .



or one at a time . . .

FISCHBEIN®

BAG CLOSING EQUIPMENT

saves *time* and *money!*

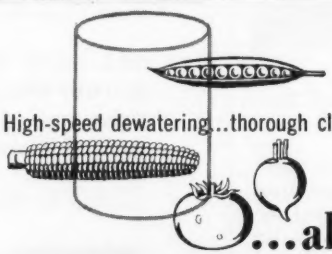
For fast, secure closing of bags in any production application, you can depend on efficient, low cost FISCHBEIN BAG CLOSING EQUIPMENT... a complete line ranging from completely portable to fully automatic production line machines. Fischbein equipment performs reliably on all kinds of textile or paper bags.

WRITE FOR COMPLETE CATALOG—FILE OF FISCHBEIN BAG CLOSING EQUIPMENT

DAVE FISCHBEIN CO. DEPT. 2A

2720 30th Avenue S., Minneapolis 6, Minn., USA

6477 on Reader Service Slip.



High-speed dewatering...thorough cleaning...easy inspection!

...all yours with

Link-Belt Vibro-Clean screens

Here's your best choice for fast, sanitary, low-cost cleaning and dewatering of food products. High-speed vibration assures high-capacity handling . . . *without blinding!* Material is evenly discharged to inspection table. And the absence of corners and crevices prevents bacteria build-up. Write for Book 2777.

LINK-BELT

VIBRATING SCREENS

LINK-BELT COMPANY, Prudential Plaza, Chicago 1, Illinois

6478 on Reader Service Slip.

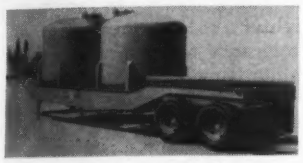
provides space for reporting number of trips, trip time, number of stops, mileage, loads and fuel and oil consumption.

Check 6479 — for cost record book Form AD-20

Check 6480 — for driver daily report Form AD-26

Bulk pneumatic trailer halves unloading time

New "Jet-25" twin-tank dry bulk materials trailer, equipped for self-unloading by air, employs principle of high pressure with low air volume to unload up to 4000 lb per min of powdered or



Twin tanks permit simultaneous delivery of diverse bulk materials

granular products through a four-in. pipe — about twice as fast as conventional units.

The twin clean-bore vessels of the " Jet-25" are light in weight, discharge their high-density materials cleanly and completely, are quickly and easily cleaned between product deliveries.

Supplier: The Heil Co., 3000 Montana Ave., Milwaukee 1, Wis.

6481 on Reader Service Slip.

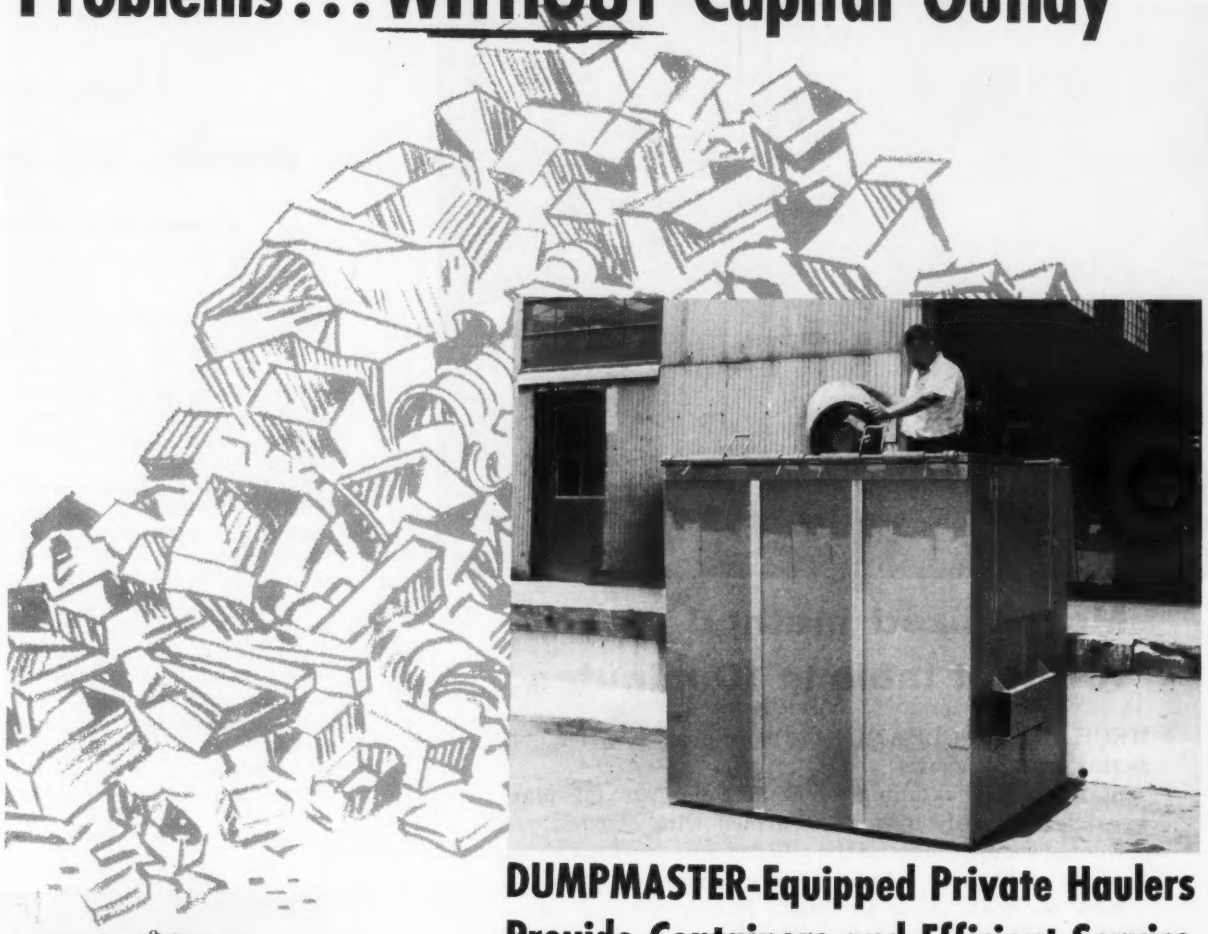
Portable belt conveyor advantages, applications

Suggestions for cutting overhead costs with three types of portable belt conveyors as well as detailed means of putting them to work, are presented in six-pg bulletin 300, offered by The Rapids-Standard Co., Inc.

Besides illustrations of the lightweight aluminum unit, the general-duty unit and the heavy-duty unit, the bulletin contains photographs of the conveyors in a number of applications. Specifications are included.

6482 on Reader Service Slip.

NOW! You Can End Refuse Storage Problems... WITHOUT Capital Outlay



IN ALL LEADING CITIES FROM COAST TO COAST

DEMPSTER DUMPMASTER®
Equipped Private Haulers

DUMPMASTER-Equipped Private Haulers Provide Containers and Efficient Service

If you're plagued with trash piles, scattered refuse, fire hazards, and hit-or-miss collection, there's a good chance you can do something about it . . . WITHOUT CAPITAL OUTLAY!

In most major cities DEMPSTER-DUMPMASTER-equipped private haulers will put clean, big-capacity storage containers at convenient locations in your plant . . . empty them mechanically on schedule, or on a call-in basis . . . all for a reasonable monthly fee.

When you containerize your refuse, plant housekeeping becomes easy, employee morale goes up.

Write today for the name of your nearest private hauler. We'll also send literature describing his service.

Write Today for
Free Brochure and Name of Nearest Private Hauler
DEMPSTER BROTHERS
Inc.
Dept. FP-4 KNOXVILLE 17, TENNESSEE

6483 on Reader Service Slip.

The big PLUS + in Oakite

SERVICE · EXPERIENCE · RESEARCH · PERFORMANCE

Mechanized method cleans 100-foot table in 10 minutes

MECHANIZED CLEANING is more profitable cleaning, as this example shows:

Stainless steel skinning tables at a fish packing plant were cleaned daily by a crew armed with brushes and powdered soap. Scrubbing the oily deposits from each hundred-foot table was a tedious, time-consuming job.

Now one man, using an Oakite Hot-Spray Unit and a solution of Oakite Composition No. 20, gets this same table shining bright in just *10 minutes!* What's more, the unit is doing a wonderful job cleaning floors, walls and canning equipment.

The big PLUS in Oakite

Working with Oakite is like adding the services of a consulting sanitation engineer. It brings you the latest information on modern cleaning methods . . . time–and money-saving equipment . . . results of continuing research . . . a vast background of experience . . . materials guaranteed to perform. Ask your local Oakite man for a demonstration. Or, write for Bulletin F-9414. Oakite Products, Inc., 26G Rector Street, New York 6, N. Y.

OAKITE

over 50 Est. 1909 SCIENCE years' leadership in industrial cleaning

Technical Service Representatives in Principal Cities of U. S. and Canada

6484 on Reader Service Slip.

Design and mass produce unique plastic pump to . . .

Lower cost of gear, impeller, and centrifugal pumps

Exposed metal parts can be stainless steel

WITH ALL MAJOR PARTS molded in plastic, pump can handle practically any liquid. Also, it is up to 50 per cent smaller and up to 80 per cent lighter than similar metal pumps.

Plastic pumps have a volumetric efficiency of 98 per cent and overall efficiency of 80 per cent by tests conducted in a public testing laboratory.

Pump parts are molded from Du Pont's Delrin® acetal resin, a plastic that is dimensionally stable, tough and unaffected by most chemicals.

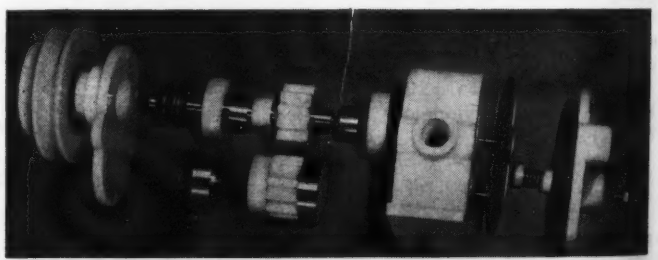
For applications where plastic is incompatible with liquid to be pumped, gears and metal liner of stainless steel or other metal can be fitted into pumps.

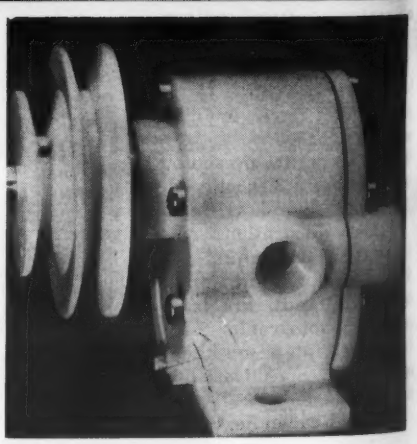
Since plastic has low coefficient of friction, pumps run quietly and minimize heating of liquid. Also, no lubrication is required.

Maintenance is further reduced by permanent O rings in cover seals. In addition, tighter tolerances prevent "tolerance accumulations" thus minimizing wear on gears and cover plates while providing higher efficiency.

Plastic pumps, manufactured by Planet Products Corporation, 221 N. La Salle St., Chicago 1, Ill., are available in three types: general-purpose gear pumps, centrifugal pumps and impeller pumps.

Gear pumps range in six sizes from 2 to 18.5 gpm at discharge pressure of 100 psi.





Attractive, glossy-white plastic pump requires no outrigger or bearing-loaded pedestal when used with pulley drive. Patented coupling transferes all undesirable loads from drive shaft to external surface of pump housing.

Eleven parts of pump are molded in plastic, including drive sheave, cover plates, housing, gears, bearings and relief valves. Precision injection-molding technique for parts was developed by Artag Plastic Corporation of Chicago, Illinois

Power required ranges from ¼ to ½ hp.

Centrifugal pumps are made in three sizes from 2.2 to 35 gpm at 0-ft head (up to 8 gpm at 24-ft head). Motors required for this series range from ¼ to 1/3 hp.

Impeller pumps are also made in three sizes. They have a capacity from 7 to 22 gpm at 0-ft head and 0-psi pressure (1.25 to 12 gpm at 6-ft head and 25-psi pressure). Power requirements range from 1/3 to ¾ hp.

None of the pumps weigh over 5 lbs. Temperature range for pumpable liquids extends from 180 F down to −70 F.

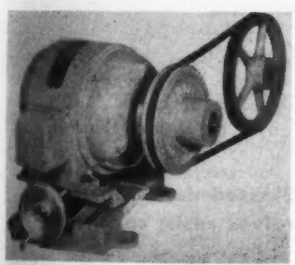
Pumps are priced from $25 to $30 as a result of simplicity in design and mass production of plastic parts.

6485 on Reader Service Slip.

Adjustable motor base for angular positions

Two models of an unusual adjustable motor base are presented in a bulletin (No. 95) from Speed Selector Inc.

They are designed for use in installations where angular motor positions are desired. Self locking speed variation is



Adjustable motor base includes speed indicator

accomplished by hand wheel adjustments to alter diameter of spring loaded variable speed sheaves.

Setting at the desired speed is facilitated by an indicator scale located at the side of the base. Dimensional drawings and selection tables are provided showing proper selections for installations with ½ through 10 hp motors.

6486 on Reader Service Slip.

NEW Butterfly Valve!

MATCHLESS LUNKENHEIMER QUALITY

FIG. 4026N
Complete Valve with Ends on Casting.
2"-6".
Screwed End.

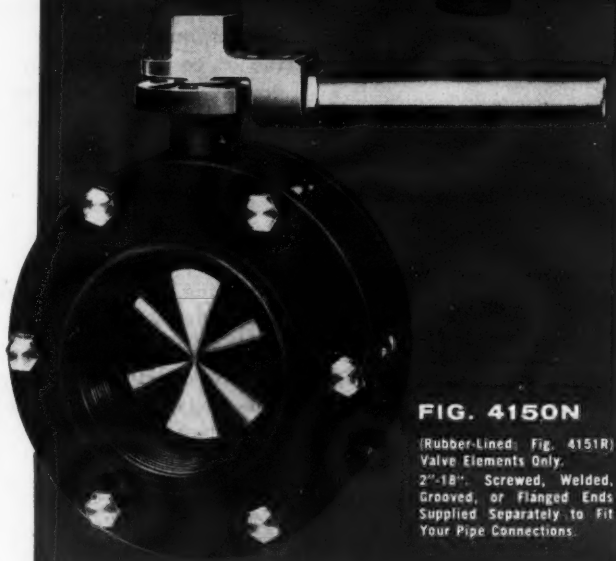


FIG. 4150N
(Rubber-Lined. Fig. 4151R) Valve Elements Only.
2"-18". Screwed, Welded, Grooved, or Flanged Ends Supplied Separately to Fit Your Pipe Connections.

W. P. 150 psi.

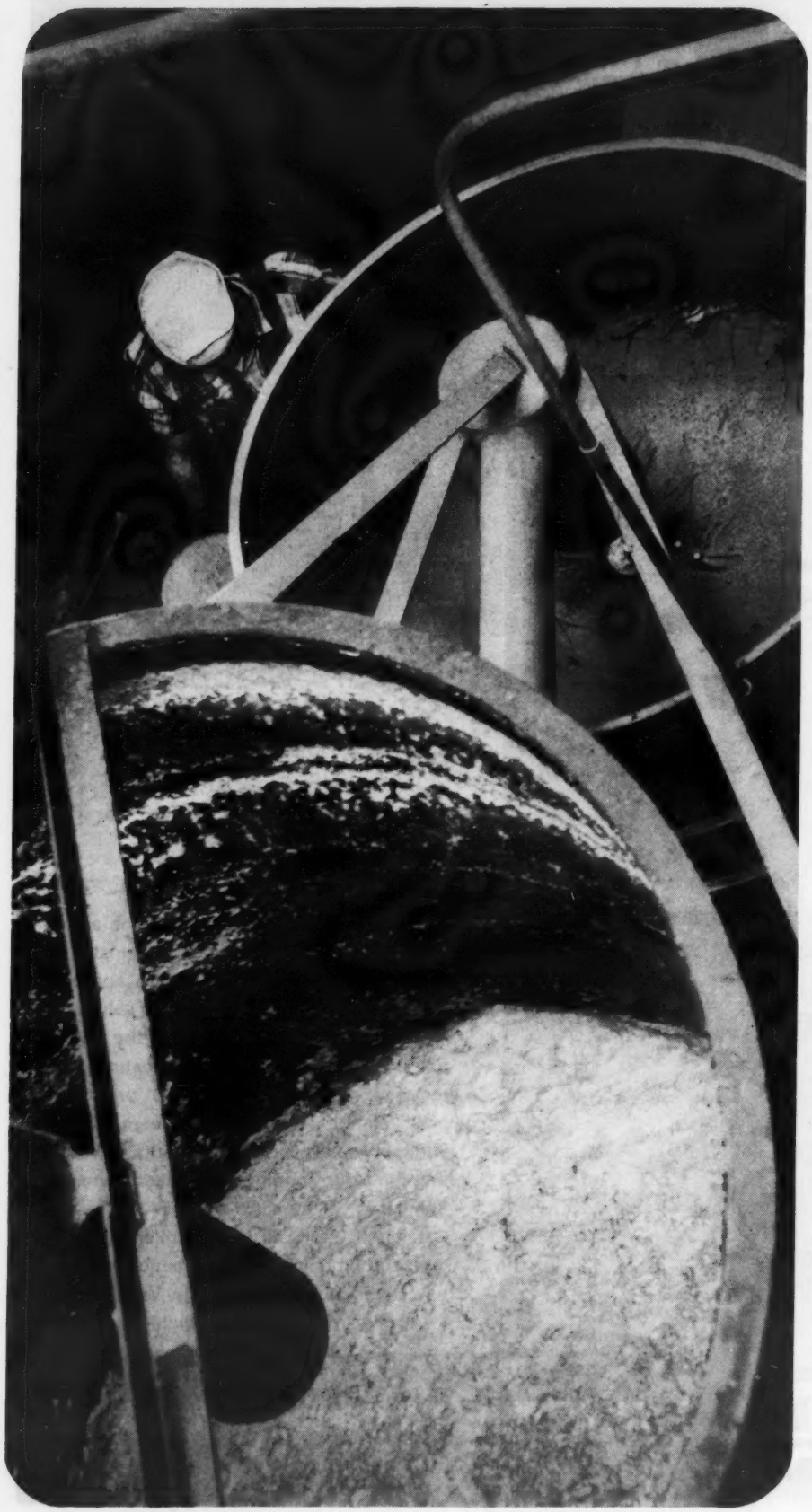
- QUICK OPENING
- POSITIVE CLOSURE
- NICKEL-PLATED CAST IRON
- STAINLESS STEEL TRIM
- "O" RING SEALS

New Lunkenheimer Butterfly Valves are compact and lightweight, easy to install on any line in a fraction of the space required by standard gate or plug valves. A quarter-turn of the stem opens the disc full or closes it tight. No lubrication is required, and "O" Ring seals provide positive shut-off in either vacuum or pressure service. These new Butterfly Valves are made to traditional Lunkenheimer standards of quality. WRITE for new Catalog 613 or call your Lunkenheimer distributor today for full information on the new Lunkenheimer Butterfly Valve line . . . available now for immediate delivery.

L-361-23

LUNKENHEIMER®

6487 on Reader Service Slip.



Van Camp Sea Food Co. solves disposal of 24,000 gallons of waste water per hour...

One 48-inch SWECO Vibro-Energy Separator cuts time in half, saves space, power and maintenance in efficient waste processing for Van Camp Sea Food Co. Port of Los Angeles. Nineteen other SWECO units have served this major packer of Chicken of the Sea brand tuna, in production operations throughout the plant, for as long as 10 years. Since SWECO has been on the job, costly installation, down-time, screen blinding and transmitted vibration have been alleviated — all serious problems with previous hexagon rotors. Greater recovery of solids from "stick water," for recanning, meal or fertilizers, has been an added profit factor. For full details, application data, or free screening demonstration in *your* plant with *your* materials, write to

SOUTHWESTERN ENGINEERING COMPANY
4800 Santa Fe Ave.
Los Angeles 58, Calif.
Dept. 214.

SWECO

✦ Vibro-Energy separators, grinding mills, finishing mills ✦

6488 on Reader Service Slip.

Gritty surface coating provides sure footing

Problem: Employees at the Nestlé Co., Fulton, New York, stand on a wooden platform to work on a filter press used for cocoa buttter. Naturally the platform gets greasy because of drips, leaks and tracking resulting in a personal safety hazard.

Solution: A new-type anti-slip surface was applied. A granulated grit was applied between two coats of a floor coating called, Dura-Grip.

The imbedded granulated grit results in a durable sandpaper-like surface.

Results: Because of improved safety experienced in the first six months, Nestlé plant officials are considering similar applications to decks and docks where other slipping conditions develop.

Supplier: Mine Safety Appliances Co., Braddock, Thomas, and Mead Streets, Pittsburgh 8, Pa.

6489 on Reader Service Slip.

Glassed-metal pipes and valves resist corrosion

Glassed-metal pipes, valves and fittings are described and illustrated in a 16-page bulletin, No. 987, issued by The Pfaudler Co., a division of Pfaudler Permutit, Inc.

Bulletin presents a short introductory paragraph on the need for glassed-metal pipe and accessories as a vital link in installations that require resistance to corrosion or contamination of product.

Separate sections in the bulletin are devoted to standard Glasteel pipe, non-adherence Glasteel pipe, expansion joints,

field cut Glasteel pipe, glassed ductile iron fittings, sight boxes, valves, spray rinse valves and other standard items.

Also included are many photos as well as cut-away diagrams and complete specifications and dimensions for all components discussed.

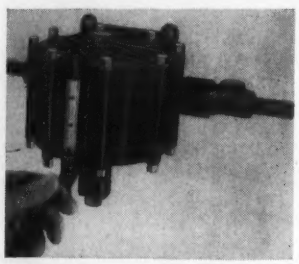
6490 on Reader Service Slip.

Low cost chlorinator uses chlorine gas

Uses-Features: An inexpensive chlorinator is designed to meter chlorine gas into water and then feed the resulting solution into plant water system. It is particularly adaptable where automatic proportional control is not needed.

The Model 845 Chlorinizer operates without separate power because it utilizes the head pressure existing in water mains.

Description: A small portion of water is by-passed from the water main through the chlorinator where a concentrated solution is produced. The concentrate is then returned to the water main at



Chlorine gas enters at the bottom, fresh water enters at the right, and concentrated solution leaves at the left

a down stream position where blending of fresh water and concentrated chlorine occur.

Three chlorine feed ranges can be used to vary feed rates from 2 through 100 pounds of chlorine gas per 24 hour period. Flow rate is set by manual flow indicator.

Measurements are 13½ inches long, 7½ inches high, and weight is 3¾ pounds.

Supplier: B-I-F Industries, Inc., P. O. Box 1342, Providence 1, R.I.

6491 on Reader Service Slip.

DIVERSEY D-SPRA 700 ***portable spray cleaning unit cuts overhead.*** (Pat. applied for)

Spray cleaning has to be thorough, but it need not be expensive. If you don't have a permanent spray cleaning installation, but want the advantages of thorough spray cleaning, you'll find the Diversey D-Spra 700 provides the practical, effective and economical method for proper systematic cleaning of *many* tanks.

D-Spra 700 weighs less than 15 lbs. It can be mounted or removed from the manhole in *seconds* to service every tank in your plant. This portable unit completely cleans horizontal tanks up to 20 feet long and 12½ feet in diameter, vertical tanks up to 16 feet high and 12½ feet in diameter. Delivers a high volume of spray at comparatively low pressures. The stainless steel spray head has no moving parts to clog or corrode. Adjusts to fit all standard size manholes.

Want to see results? Call your Diversey D-Man and ask for a demonstration. For literature write THE DIVERSEY CORPORATION, Chicago 6, Illinois.

DIVERSEY F-120 ***spray and circulation cleaner ideal for cold milk equipment.*** (Pat. Pend.)

F-120 rapidly penetrates, emulsifies and removes milk soils. Greater cleaning efficiency lowers cleaning costs . . . every F-120 wash solution lasts longer, cleans more tanks. *Available* chlorine sanitizes and deodorizes equipment. Leaves tanks brighter, sweeter smelling. Special water softening properties for film-free, spotless rinsing. For best cleaning results, use Diversey D-Spra 700 with F-120 in cold milk storage tanks.

Sanitation products from Diversey research

DIVERSEY

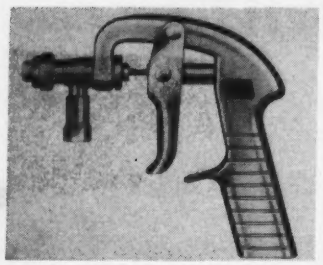
6492 on Reader Service Slip.

Pesticide sprayer has self-cleaning features

Uses-Features: The NL GunJet hand sprayer is designed to produce various capacities and spray patterns by interchanging orifice tips. Because fine sprays or straight stream ejection is possible, it is particularly adaptable to use as a pesticide sprayer.

Chemical solutions flow through the forward section, valve and tip, without contacting the trigger control assembly.

Since no air is used for atomizing sprays, it is adaptable to pressurized portable tank systems having pressures up to 800 psi.



Trigger-lock holds gun open for continuous spraying

Description: Valve seals are made of nylon and the inlet body, cap, and orifice tip are made of stainless steel or brass. The valve needle is designed to pass through the seal orifice thereby keeping the valve clean automatically.

The overall length is 6 inches and weight is 12 ounces.

Supplier: Spraying Systems Co., 3201 Randolph Street, Bellwood, Ill.

6493 on Reader Service Slip.

Insulated piping in prefab sections

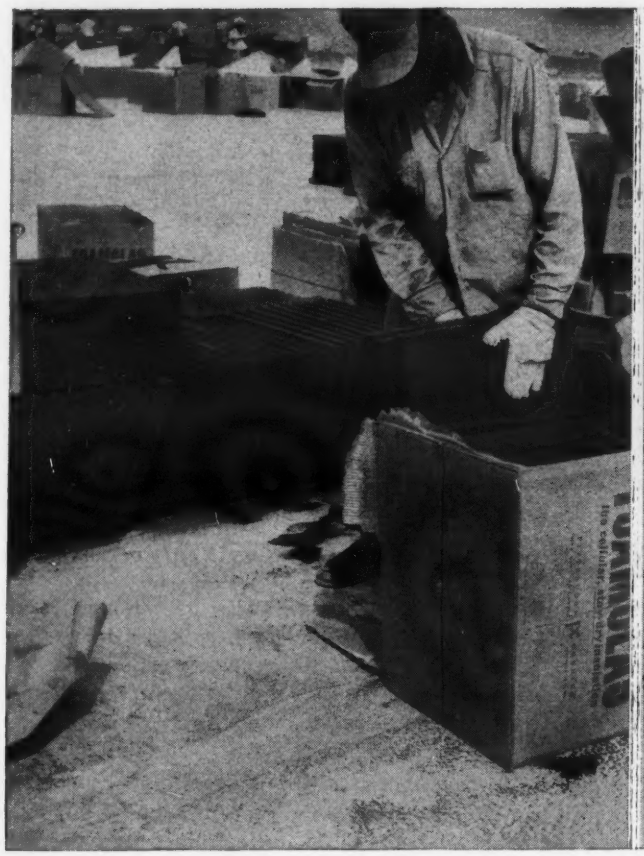
Uses: Two prefabricated piping systems are made for use in distribution of steam, hot water, process liquids or refrigerants. One is designed for overhead installation and a similar system is designed for underground installation.

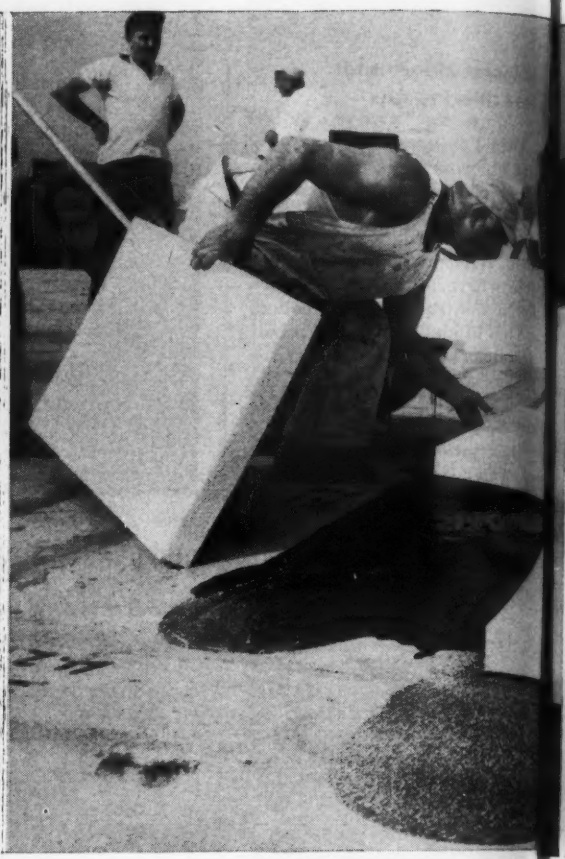
Features: Overhead piping is covered with insulation and

FOAMTHANE™

has an important new partner

PC's new rigid polyether urethane foam insulation now FOAMGLAS® Insulation





Now you can achieve the reliable insulation performance of FOAMGLAS while adding usable space in low temperature areas. For instance, it is now possible to add approx. 5000 ft. of usable space to a typical 200′ x 200′ x 20′ high refrigerated room.

Why? The answer is a combination of FOAMGLAS with Pittsburgh Corning's new FOAMTHANE Insulation to reduce required total insulation thickness by as much as 50%.

FOAMTHANE is a completely new rigid polyether urethane foam insulation. Its thermal conductivity is only 0.15 from +40°F. to +70°F. mean temperature. This means maximum thermal efficiency with minimum thickness. FOAMTHANE Insulation has a closed cell composition. Its compressive strength is 15 p.s.i. @ 5% deflection and the cost of FOAMTHANE is substan-

result . . .

a new low temperature insulation system to deliver the benefits of reduced thickness and lower cost

tially under that of other quality thermal insulations.

When one or more layers of FOAMTHANE are combined with a layer of FOAMGLAS, the result is a thermal insulation system which delivers more performance at less cost than has ever before been possible. Total insulation thickness is held to a minimum, and the system is completely impervious to liquids and vapors.

Discover more about the important benefits of this unique new insulation system. Mail the coupon today. Pittsburgh Corning Corporation, One Gateway Center, Pittsburgh 22, Pennsylvania.

PITTSBURGH pc CORNING

Pittsburgh Corning Corporation
Dept. FP-41
One Gateway Center
Pittsburgh 22, Pennsylvania

Gentlemen:

☐ Please send me your new FOAMTHANE Booklet containing complete physical and thermal properties.

☐ Please have your representative call to discuss my specific insulation problems.

Name_____ Title_____

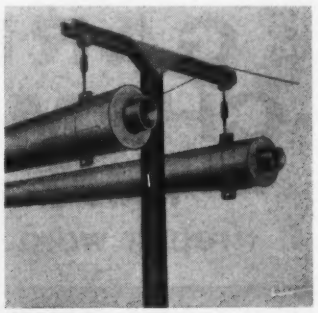
Company_____

Address_____

City_____ Zone____ State_____

6494 on Reader Service Slip.

aluminum foil jacket, over which are two wrappings of fibre glass cloth impregnated with plastic coating. Under-



Prefabricated piping system is easily and quickly installed

ground piping is covered with insulation and a metal conduit jacket.

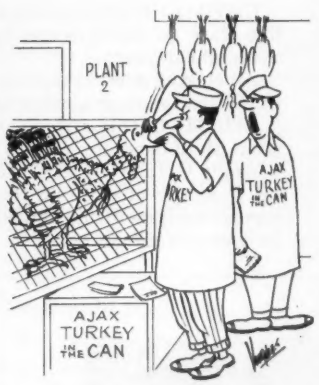
All necessary fittings and accessories needed for installations are provided for assembly at the construction site.

Joints are welded or threaded on the construction site and factory prepared insulation material is applied at the joint to accomplish final sealing.

Description: Sizes range from ¾ inch to 2½ inch diameter for overhead installations and up to 20 inches diameter for underground installation. Standard section lengths are 21 feet.

Supplier: Ric-wiL Incorporated, Barberton, Ohio.

6495 on Reader Service Slip.



"Oh, for Pete's sake, Joe . . . it's only a 19¢ ballpoint pen."

NOW! a FLOOR that flows from a can!

New and Exclusive... GARLAND CHEMI-COTE

flows on in minutes to repair worn concrete floors

Save Major Floor Repairs

Stop Abrasive Wear

End Floor Deterioration

Liquid plastic CHEMI-COTE fills small holes and seals hairline cracks; makes a smooth, tough surface that resists abrasion and corrosion.

CHEMI-COTE flows on over spalled, cracked and worn concrete floors to form a tough, durable surface that is smooth, non-porous, easy to clean.

CHEMI-COTE requires no bonding or slush coat, forms an armor-like plate ½" thick in one application, withstands truck traffic after overnight drying.

An elastic, new-formula material available in four colors, CHEMI-COTE expands or contracts without chipping, cracking or dusting. A CHEMI-COTE surface has four times the compressive and tensile strength of concrete, carries heavy loads without rutting or grooving.

Apply CHEMI-COTE in three easy steps: (1) *Mix* the ingredients; (2) *Pour* the mixture on the floor; (3) *Brush* it smooth. Requires no special equipment, no skilled personnel. Try it for new dependability in floor maintenance.

Send for complete literature, color samples and prices.

GARLAND

Improved Products Through Modern Coating Chemistry

THE GARLAND COMPANY

3748 E. 91st Street, Cleveland 5, Ohio

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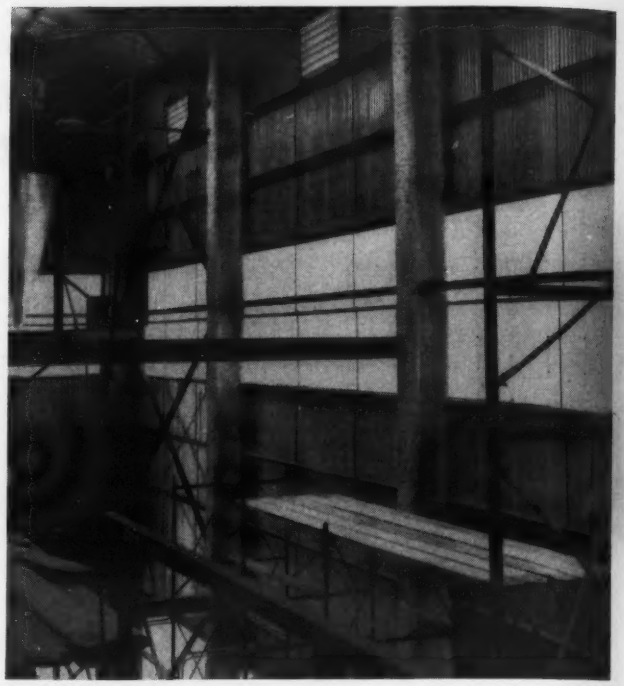

Vertical I-beam columns along the outer wall as they appear after insulation

Thermal insulation of building supports . . .

Saves $9000 a year fire insurance

PROBLEM: Dannen Mills, Inc., new soy bean plant at St. Joseph, Mo., is supported by 14 steel columns. To secure a lower fire insurance rate, insurance engineers suggested that the steel columns be insulated.

Several conventional fireproofing materials, such as concrete and plaster, were ruled out because of difficulties that would be encountered in applying them to the 57 foot high structure. Furthermore, the added weight would possibly overload the structure.

Solution: Instead of heavy concrete or plaster, a lightweight and better insulating material was used to protect the columns. It is a mixture of asbestos, inorganic binder and water called Limpet which is easily applied by spraying.

For adequate protection, a 1¼ inch blanket of Limpet asbestos was spray shaped to the fourteen steel I-beams which support the building and the roof.

Result: Insulating the steel structure resulted in a reduction of fire insurance premiums by $9000 a year. The Limpet Asbestos covering is designed to prevent the I-beams from getting hotter than 250 F during the first two hours.

Supplier: Limpet asbestos for spraying is a product of Keasby & Mattison Co., 1958 Butler Ave., Ambler, Pa.

6497 on Reader Service Slip.

Industrial hose reel is electrically powered

Uses-Features: For ceiling or wall mounting of a hose reel to save floor space. Forward and reverse reeling is

A ceiling mounted reel is shown with a pendant control line extending beyond the lower edge of the illustration

provided by 1/3 hp motor.

Description: The Zierco Hose Reel operates at the rate of 100 feet per minute. Depending on hose sizes, reel capacities vary from 50 to 500 feet.

Supplier: Zierden Co., 3815 S. Kinnickinnic Ave., Milwaukee 7, Wis.

6498 on Reader Service Slip.

Improved service system for hermetic refrigerators

Test kit determines degree of burnout

Guesswork in servicing of motor or electrical failures in a hermetic refrigeration system can be eliminated.

A simple field test shows the extent of contaminants resulting from burnout, the cleaning procedure to use, and determines when cleaning is complete.

If mildly contaminated, it is now possible to clean the refrigeration system without pumping by flushing with refrigerant from pressurized cylinders.

A development of General Chemical Division of Allied Chemical, 40 Rector St., N.Y., manufacturers of "Genetron" refrigerants.

6499 on Reader Service Slip.

HERE'S WHERE YOU CUT PUMPING COSTS

Impeller adjustment **PLUS** interchangeable fluid ends add up to unrivaled pumping economy

Pumping citrus concentrates, seaweed or just plain water, Deming two ball bearing End Suction Centrifugals stay right for your particular application. Power frames are designed to accept interchangeable liquid ends of cast iron, all bronze, stainless steel and other alloys. Capacities range up to 3000 GPM.

Normal impeller wear poses no problem with Deming two ball bearing End Suction Centrifugals. Deming's adjustable impeller permits easy "on line" adjustment of discharge head for continuous optimum capacity.

Deming Rotaries, Motor-Mounts, Sump or Process pumps, Vertical Turbines and Submersibles are also of special interest to the food processing industry. For complete descriptive literature mail the coupon.

THE DEMING CO.
450 Broadway • Salem, Ohio

Please send me catalogs on: (type)_____ pumps
for (application)_____
NAME_____
ADDRESS_____
CITY_____ ZONE____ STATE_____

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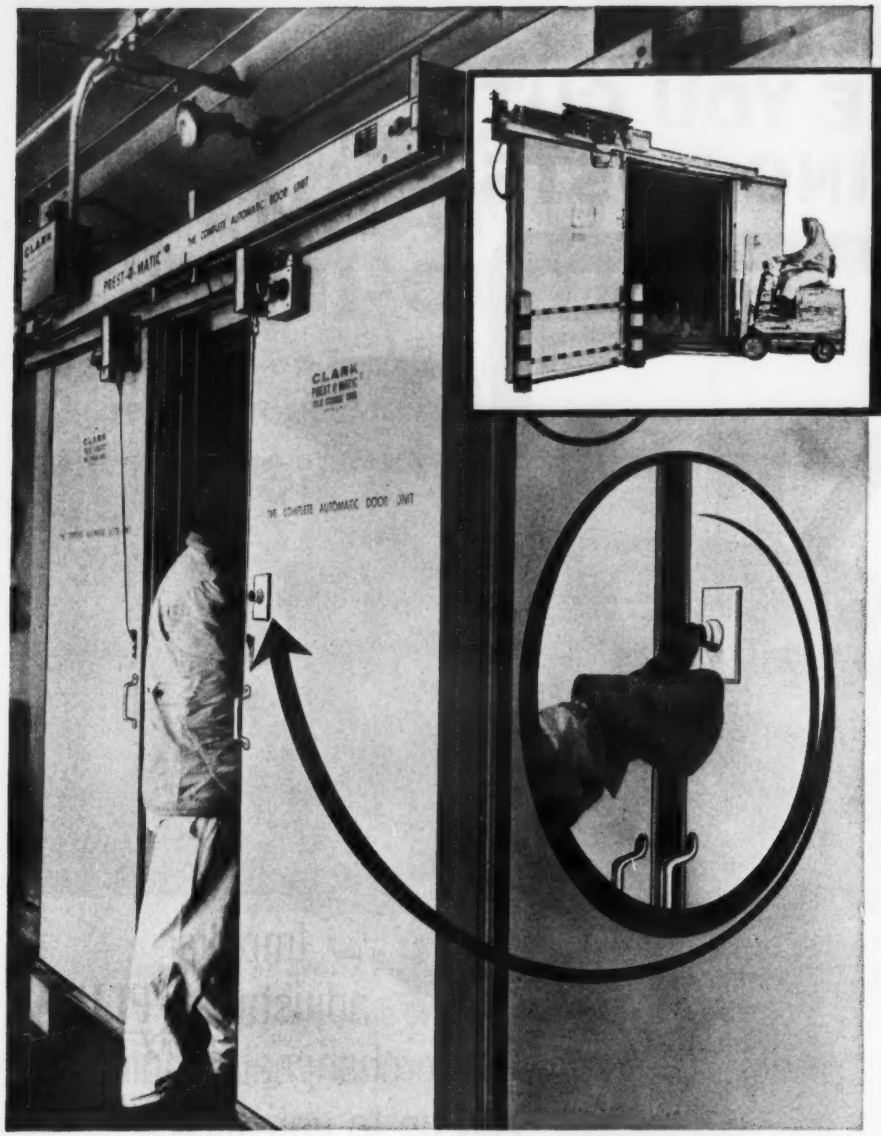


Fork truck jockeys need full width openings . . . FOOT TRAFFIC *does not*

NEW P·O·M* PEDESTRIAN CONTROL

cuts open door time by up to **70%!**

No need to open PREST-O-MATIC Cold Storage Doors full width when pedestrians walk through. The New POM (Partial Opening Man) Control saves valuable refrigeration because it opens wide doors only 32 inches for foot traffic.

This exclusive feature can be incorporated in any PREST-O-MATIC doorway — new or existing. POM pushbuttons are mounted on both sides of the door panel. Pressed at either side, the POM Control opens the door just wide enough for comfortable entrance or egress. The door closes PREST-O-MATICALLY behind the pedestrian.

If your Cold Storage doorways are used by foot traffic as well as trucks, you *need* the POM Control. Why not investigate *all* the advantages PREST-O-MATIC Doors give you? Write today for full information.

CLARK DOOR COMPANY, INC (since 1878)

518 Hunterdon St., Newark 8, N. J.

*Partial Opening Man *Control*

6501 on Reader Service Slip.

Steel grating and stair treads

A twelve page bulletin (No. 1112) offered by Dravo, Inc., provides information about a line of industrial steel gratings and stair treads.

Information is included about designs, load strength, installation, and fastening.

6502 on Reader Service Slip.

Spray system applies heavy floor coating

1/32" to 3/32" thick; five times faster

Uses: A spray gun which applies thick plastic floor coatings is rented on a daily basis. It will apply an even coating of epoxy resin from 1/32 to 3/32 inch thick, including added filters such as silica sand or aluminum oxide.

Features: Since spray gun applications are five times faster than conventional trowling, less plant shut down time results. Two men working with the sprayer can cover 2500 square feet per day.

Sprayer operator can apply coating as fast as helper can mix the material

Description: Air pressure is applied at a 10 gallon holding tank to force material through a 2 inch hose to the spray nozzle. Atomizing air pressure, regulated at the nozzle, forces sprayed material into a round pattern.

The holding tank is emptied in a period of 10-12 minutes of continuous spraying. Sufficient quantity to cover 140-160 square feet of floor or wall space to a depth of 3/32 inch is contained in a full

holding tank.

When plant operators prefer to do the work with their own crews, a field service technician is required on the first application at a plant.

Supplier: Carboline Company, 32 Hanley Industrial Court, St. Louis 17, Mo.

6503 on Reader Service Slip.

Compressed air filter is highly efficient

A line of compressed air filters is designed to remove entrained dirt, oil and water by using an unusual coalescence cartridge.

The cartridge is saturated with a special liquid which causes coalescing action.

Air leaving the cartridge reverses flow direction and passes upward through a dry-bed cartridge where traces of

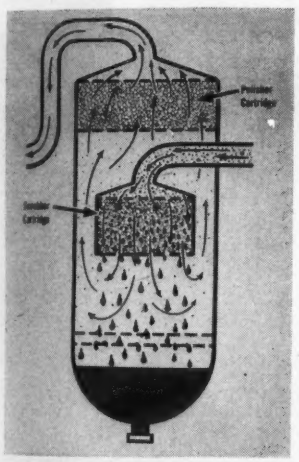


Diagram of the filter shows how air passes through the unit to be cleaned. Pipe connections are ¼ to 2 inches diameter. Accumulations of water and oil are drained away at the bottom.

oil and water are removed.

It normally operates for months without service and replacement of exhausted cartridges restores original performance.

Maximum flow rates range from 20 to 200 cfm and pipe sizes rang from ¼ to 2 inches diameter.

Supplier: King Engineering Co., P.O. Box 735, Ann Arbor, Michigan.

6504 on Reader Service Slip.

YARWAY news briefs

from **Yarnall-Waring Company,** *Philadelphia 18, Pa.*

BRANCH OFFICES IN 19 UNITED STATES CITIES • SALES REPRESENTATIVES THROUGHOUT THE WORLD
STEAM TRAPS STOCKED AND SOLD BY 270 LOCAL INDUSTRIAL DISTRIBUTORS

The whole works—steam trap, strainer and blow-down valve—fit in the palm of your hand

ENTHUSIASTIC APPROVAL!

INDUSTRY WELCOMES NEW SERIES 130 IMPULSE STEAM TRAP WITH OPEN ARMS

"Radically new and different—send 50."
TEXAS INDUSTRIAL

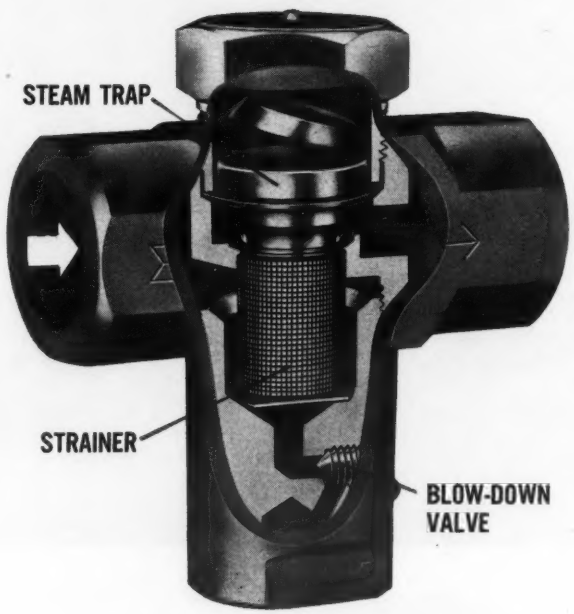
"We want 100 immediately. They meet our confined space needs perfectly."
WISCONSIN PACKER

"Ordering 60 as first part of new standardization program."
LOUISIANA REFINERY

"We'll start with 24—more later."
OHIO PETRO-CHEMICAL

So it goes—industry's welcome to the new Yarway Series 130 combination steam trap has been a warm one. Already manufacturing quotas have been doubled to meet the demand. Yarway distributors everywhere are busy answering their customers' requests for demonstrations.

What will the new Series 130 do for you? Consider these advantages:



COMPACT COMBINATION SAVES SPACE, MONEY, MAINTENANCE ON LIGHT LOAD APPLICATIONS

Steam trap, strainer, blow-down valve combination simplifies trapping hook-ups—saves up to 30% in time and materials over ordinary hook-ups.

NO OTHER STEAM TRAP COMBINES SUCH COST-SAVING, WORK-SAVING FEATURES

All stainless steel construction, woven stainless steel strainer screen, replaceable trap valve-seat assembly, Allen wrench-operated blow-down valve—make maintenance easy.

Small size, light weight, good for all pressures 8 to 600 psi—make installations simpler.

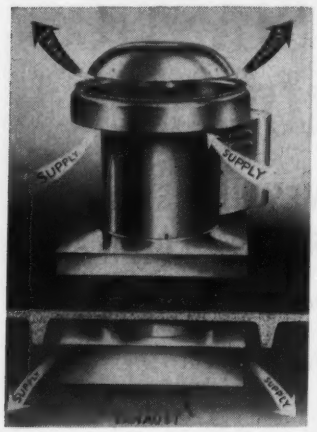
Try this trap on your steam main drips, steam tracer lines, meter boxes or any other of thousands of light condensate load applications. Call your nearby Yarway distributor today—or write us for more details.

6505 on Reader Service Slip.

Two way ventilator for intake and exhaust

Uses: A ventilator performs simultaneously as an exhaust and intake fan.

Features: Heart of the Twinalator fan is a dual purpose impeller designed so that an inner section moves air in the opposite direction to the outer section.



Motor and adjustable drive pulley are protected by removable enclosure

A two way air flow results by using two ducts. One duct for exhaust is centered inside of the larger fresh air intake duct.

Extended ducts may be attached to the unit for venting areas away from the installation point.

Description: The fan is designed for heavy duty service with air temperatures up to 200 F.

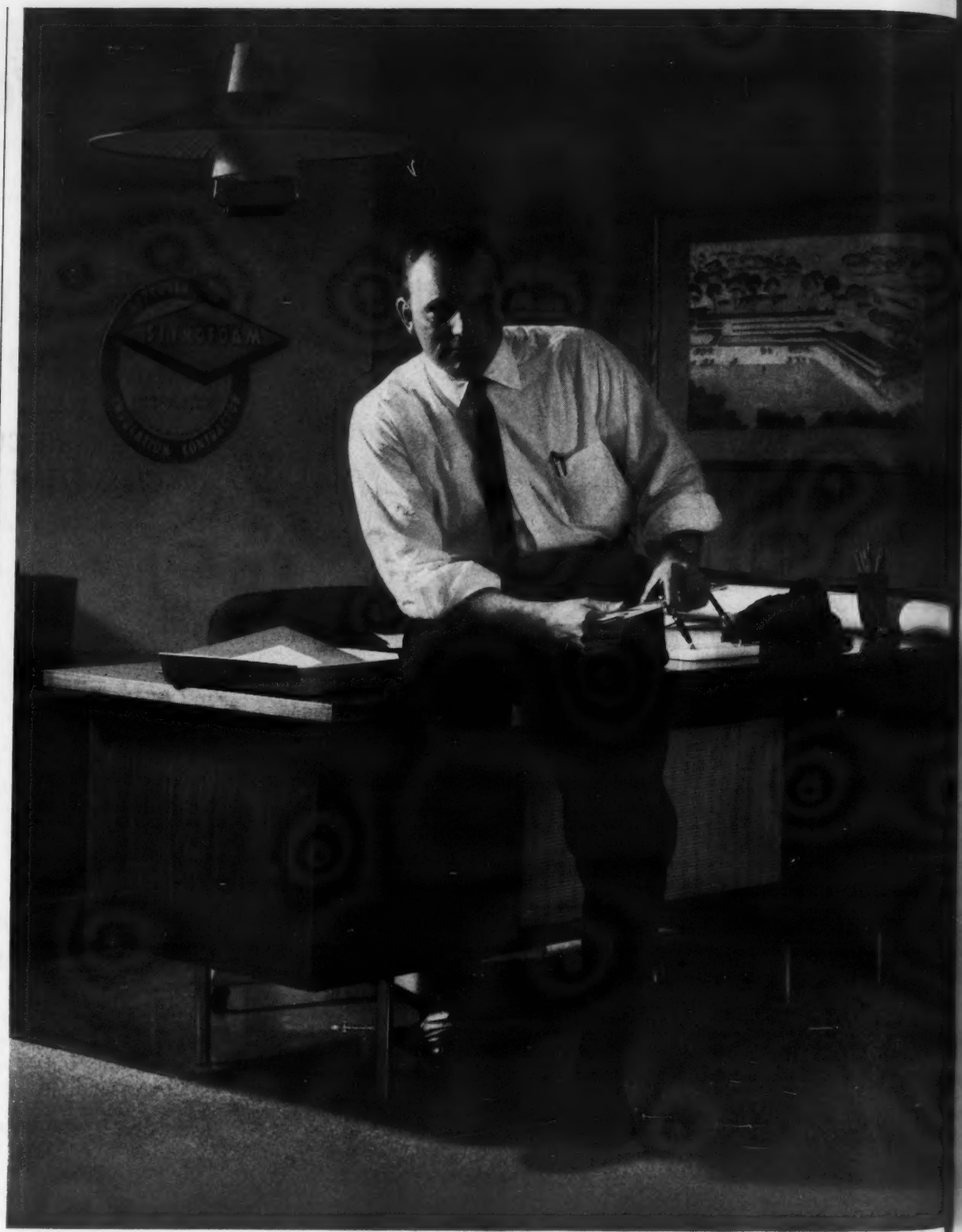
Construction features include prelubricated bearings, drive pulley mounted outside the air flow and weather protected construction.

Available in three sizes with a choice of motors ranging from ¼ to 1½ hp and having air capacities ranging from 400 to 2200 cfm.

Supplier: Clarage Fan Co., 1 Clarage Place, Kalamazoo, Mich.

6506 on Reader Service Slip.

Check page 175 for helpful technical literature



This man knows STYROFOAM® and low-temperature installation, too

HE'S AN APPROVED INSULATION CONTRACTOR, typical of the special group of low-temperature insulation contractors that Dow has selected for their outstanding experience and abilities in installing Styrofoam. Each Approved Insulation Contractor listed below has a reputation for top-quality workmanship. All 103 of these firms are thoroughly familiar with Dow recommendations for installing Styrofoam, and they are committed to follow these recommendations on every job.

Consult an Approved Insulation Contractor when you're planning your next freezer or cooler room. The superior *insulating* performance of Styrofoam, teamed with the superior *installing* performance of an Approved Insulation Contractor, is your assurance of a top-quality job.

Styrofoam is a registered trademark of The Dow Chemical Company. It is applied only to the homogeneous expanded polystyrene made according to an exclusive Dow process. Styrofoam brand insulation board is available only from Dow and its authorized representatives.

SAVE THIS LIST FOR REFERENCE

For the best low-temperature installation, get in touch with the Approved Insulation Contractor near you.

ALABAMA
Birmingham
Badham Insulation Company, Inc.
Bonitz Insulation Company of Alabama

ARIZONA
Phoenix
Barrett & Homes
Tucson
Arizona Insulation Company, Inc.

ARKANSAS
Little Rock
J. C. Lewis Company

CALIFORNIA
Fresno
Fiberglas Engineering & Supply Div.
Los Angeles
Armstrong Contracting & Supply Corp.
Fiberglas Engineering & Supply Div.
Los Angeles Cork Company
Industrial Building Materials, Inc.
North Sacramento
Fiberglas Engineering & Supply Div.
San Francisco
Fiberglas Engineering & Supply Div.
Peterson-Cobby Insulation, Inc.
San Diego
Fiberglas Engineering & Supply Div.

CONNECTICUT
Bloomfield
W. L. Walker Co.

COLORADO
Golden
Denver Lining Co.

FLORIDA
Haines City
R-S Industrial Insulation
Jacksonville
Insulation Contractors, Inc.
Miami
L. L. Jackson, Inc.
Tampa
Gulf Coast Insulation Company, Inc.
Insulation Contractors, Inc.

GEORGIA
Atlanta
Asbestos Insulation Co.
North Brothers, Inc.

IDAHO
Boise
Fiberglas Engineering & Supply Div.

ILLINOIS
Chicago
Cork Insulating Company
East Moline
Low-Temp Insulations, Inc.
Peoria
Sprinkmann Sons Corp. of Ill., Inc.

INDIANA
Indianapolis
Indiana Asbestos Co., Inc.
South Bend
Midland Engineering Company, Inc.
Evansville
General Insulation Co.

IOWA
Des Moines
Low-Temp Insulations, Inc.

KANSAS
Kansas City
Mid-Continent Ind. Insulation, Inc.
Preston Refrigeration Company

KENTUCKY
Louisville
Cardinal Industrial Insulation, Inc.

LOUISIANA
Baton Rouge
McCarty-Branton, Inc.
New Orleans
McCarty-Branton, Inc.
Shreveport
Taylor Contracting & Supply Co., Inc.

MAINE
Lewiston
Northeastern, Inc.

MARYLAND
Baltimore
F. V. Vleck Company
The Wallace & Gale Company
Cheverly
Frank Heintze Company

MASSACHUSETTS
Waltham
Atlas Insulation Company, Inc.
Walpole
Allied Cork, Inc.
West Springfield
A. L. Remington Co.

MICHIGAN
Bay City
Industrial Insulation, Inc.
Detroit
Chrysler & Koppin Company
Grand Rapids
Tony Batenburg Insulation Company

MINNESOTA
Minneapolis
General Adhesives Products Co.
Hauenstein & Burmeister, Inc.
Insulation Sales Company

MISSISSIPPI
Jackson
Munford Engineering Company

MISSOURI
Joplin
Joplin Cement Company
St. Louis
Mid-Continent Ind. Insulation, Inc.
Springfield
Southwestern Insulation & Material Co.

NEBRASKA
Omaha
Low-Temp Insulations

NEW JERSEY
East Orange
Woolsulate Corporation

NEW MEXICO
Albuquerque
Fiberglas Engineering & Supply Div.
Mountain States Insulation Co., Inc.

NEW YORK
Albany
Cork Insulation Contracting Company
Buffalo
The Jewett Refrigerator Company, Inc.
Forest Hills
Charles M. Trojahn
New York City
Eastern Cold Storage Insulation Co., Inc.
Globe Cork Insulation Company
Martin & William Smith, Inc.
Syracuse
The Knudsen Company, Inc.
Utica
George Weisenberger Company, Inc.

NORTH CAROLINA
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Bonitz Insulation Company of Carolina-Tennessee, Inc.
Goldsboro
Bonitz Insulation Company of Eastern Carolina, Inc.
Greensboro
Bonitz Insulation Company, Inc.

OHIO
Cincinnati
Breeding Insulation Company
Cleveland
Ross Insulation, Inc.
Dayton
C. W. Booher & Company
Toledo
Service Products, Inc.
Columbus
Service Products, Inc.

OREGON
Portland
E. J. Bartells Company, Inc.
Fiberglas Engineering & Supply Div.

PENNSYLVANIA
Catasauqua
Tri-City York Co., Inc.
Hummelstown
David R. Trout Associates, Inc.
Kingston
Culp Industrial Insulation Company
McKees Rocks
George V. Hamilton, Inc.
Telford
Walter R. Dorn Estate

RHODE ISLAND
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Rhode Island Covering Company

SOUTH CAROLINA
Columbia
Bonitz Insulation Co. of S. C.

TENNESSEE
Memphis
Chris Fiedler Company, Inc.
Nashville
Young Sales Corporation

TEXAS
Amarillo
Young Sales Corporation
Dallas
Southwest Cold Storage Vault Company
Houston
Gulf Insulating Corporation
San Antonio
General Supply Company

VIRGINIA
Norfolk
C. C. Foreman & Sons, Inc.
Richmond
Ralph Lampie
Roanoke
Whitescarver Engineering Company

WASHINGTON
Seattle
Associated Asbestos, Inc.
Fiberglas Engineering & Supply Div.
Spokane
Associated Asbestos, Inc.
Fiberglas Engineering & Supply Div.
Yakima
Reese & Sons

WEST VIRGINIA
Charleston
Asbestos & Insulating Company

WISCONSIN
Green Bay
Northwestern Asbestos & Cork Insulation Co.
Madison
Industrial Material Company
Manitowoc
Northwestern Asbestos & Cork Insulation Co.
Milwaukee
Sprinkmann Sons Construction Co.
Merrill
Taylor Insulation Company, Inc.

THE DOW CHEMICAL COMPANY DOW Midland, Michigan

6507 on Reader Service Slip.

Wire baskets made for various applications

Wire baskets for washing, dipping, or draining are presented in an 8 page bulletin B-10 by Newark Wire Cloth Co.

Includes illustrations of standard basket types and detailed fabrication specifications on wire cloth made from many standard metals including stainless steel.

Special sizes and shapes are made to customer drawings and specifications or will be designed to meet requirements of a special project.

6508 on Reader Service Slip.

Roller chain catalog has revised ratings

A revised 118 page catalog (No 760) of stock roller chains and accessories is available from Diamond Chain Co.

Revisions have been made to reflect the new ARSCM horsepower ratings. Higher horsepower ratings were developed as a result of research by the ARSCM.

In addition to engineering data on stock roller chains and accessories, the catalog gives full information on products for power transmission of conveyors including top plate conveyor chain, heavy duty roller chain, miniature roller chain and flexible couplings.

6509 on Reader Service Slip.

Cold-room doors—all kinds & sizes

A series of low temperature and below-zero temperature cold storage doors are presented in a 16 page catalog (A-I-A) by Chase Industries, Inc.

Included are photographs, drawings, and engineering data on each of the series including fully metal clad and stainless steel clad models.

Information is presented on a series of vestibule doors, door accessories, and an automatic door closer.

6510 on Reader Service Slip.

INSTANT STARCHES

FOR READY-MIXED SPECIALTIES

TURN OFF THE HEAT!

You name it! Cocktail dips, meat sauces, chiffons, chocolate milk drinks, fruit toppings—any dehydrated mix from soup to dessert can be thickened and stabilized with Instant Starches from National.

These new pre-gelatinized starches eliminate cooking, prolonged stirring, cooling. Housewife or chef, you simply add liquid to ready mixed specialties and stir. Another outstanding convenience in modern day specialty foods.

Instant Starches from National give every effect from glossy, crystal clear toppings to creamy homogeneous sauces. They even act as a freshener for cakes baked from mixes. We'd be glad to make recommendations. Just contact your nearest National office.

National STARCHES

NATIONAL STARCH and CHEMICAL CORPORATION

750 Third Avenue, New York 17 • 3641 So. Washtenaw Avenue, Chicago 32 • 735 Battery Street, San Francisco 11

And All Principal Cities in the United States, Canada, England and Mexico

6511 on Reader Service Slip.

". . . add a 'dash' of tomato paste . . ."

. . . in this case, the contents of a 55-gal "Sterilpac" drum — equivalent to 75 Number 10 tins — shown being emptied, with aid of an electric hoist, into a spotlessly clean stainless funnel leading into a 1000-gal mixing reservoir on floor below. Here, paste is mixed with precise quantities of vinegar, sugar, orange marmalade, raisins, salt, garlic, onions, spices and other flavorings, to produce famed "A-1" sauce.

Filled aseptically under vacuum with flash-cooled tomato paste, and sealed under vacuum, "Sterilpac" drums do away with need for additives or re-refrigeration during cross-country shipment between the West Coast concentrate suppliers and Heublein's Hartford, Conn., plant.

"Sterilpac" operation is typical of the efficiencies practiced by Heublein in accommodating greatly increased output. Since 1952, sales have rocketed from $24,820,000 to a record $103,200,000 for year ending June 1960.

"Sterilpac" drum-filling system and specially designed 55-gal drums — first described in FP, Nov. 1958 — now by Rheem Manufacturing Co, 400 Park Ave., New York 22, New York.

6512 on Reader Service Slip.

Tomato paste in special drums aseptically packed by: Flotill Products, Inc., Fresno & Charter Way, Stockton, California.

6513 on Reader Service Slip.

Thornton Canning Co., Thornton, Calif.

6514 on Reader Service Slip.

Spotlighting Regular Section on

INGREDIENTS

FOOD PROCESSING

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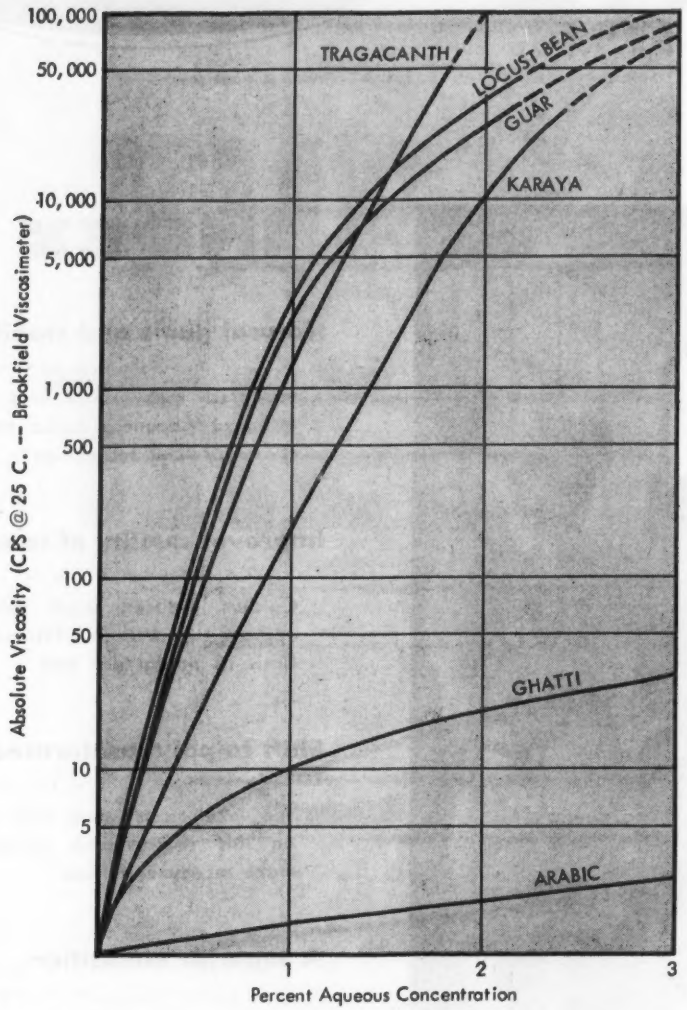

Fig. I Typical Viscosities of the Natural Gums

Although there has been justifiable stress on maximum viscosity at the lowest price, it is just as important to consider the factor of uniform viscosity. When the food processor has incorporated a certain type and grade of gum for a length of time, his formulation is finally adjusted to this particular grade. Uniformity of viscosity then assures the constant usefulness of the formulation.

Although the viscosities of different types of gums may be similar, flow characteristics may differ radically and impart significant changes to the finished product. For example, Karaya will yield viscous solutions of either a ropy or short-flow type, Tragacanth, on the other hand, will produce viscous but smooth-flowing solutions. The type of food product and the particular consistency desired should determine the type of gum to use.

Increased gum usage by food processors and recent technical advances make timely a review of the

Technology of Natural Gu

LEONARD M. WALDT
Chief Food Chemist
Morningstar-Paisley, Inc.

GUMS AND STABILIZERS, as technically employed in the food industry, refer to plant polysaccharides or their derivatives. These materials are dispersible in either cold or hot water, where they produce *viscous* dispersions or solutions — see Fig. 1.

These gums are not truly soluble in the same respect as inorganic salts or other crystalline materials, and they are rather indefinite in composition (1, 2).

Countless food products that utilize water as a base can have their properties enhanced, body or viscosity-controlled and texture stabilized through the use of gums and stabilizers. These ingredients play important roles in food products as binders, thickeners and emulsifiers. Table I lists the more important functions of the water-soluble gums with examples of food products in which they are utilized (3).

Table II gives the formulations for three widely different types of food products — a paste, a liquid and a solid — where natural gums are incorporated (4, 5). This example serves to demonstrate that gums can improve the production of a food item in any physical form.

In general, the main role of gums is to impart desirable qualities by influencing the viscosity, body, and texture of the product. These objectives are attained by incorporating gums in the concentration ranges of 0.5 to 2.0 percent.

Many factors, both physical and chemical, have a bearing on the suitability of a water-soluble gum in a food product. Table III lists the factors that determine the applicability of a water-soluble stabilizer (2, 3).

Unfortunately, there has been a lack of technical investigation of all the factors listed. For although water-soluble gums have been used since antiquity, their production and application has until recently been based on arts of long standing and not on scientific investigation.

At present, technological advances in the gum field are beginning to catch up with the processing arts in the food field. Laboratory investigation has already provided a number of blends of various gums that perform in food products in a way that no single gum or stabilizer could do. In some products, a blend of starch and gum will produce the required property or texture. Furthermore, there is a trend toward custom gums to fit specific products such as confectionery, flavoring, ice cream, baked foods, etc.

Gums and Stabilizers

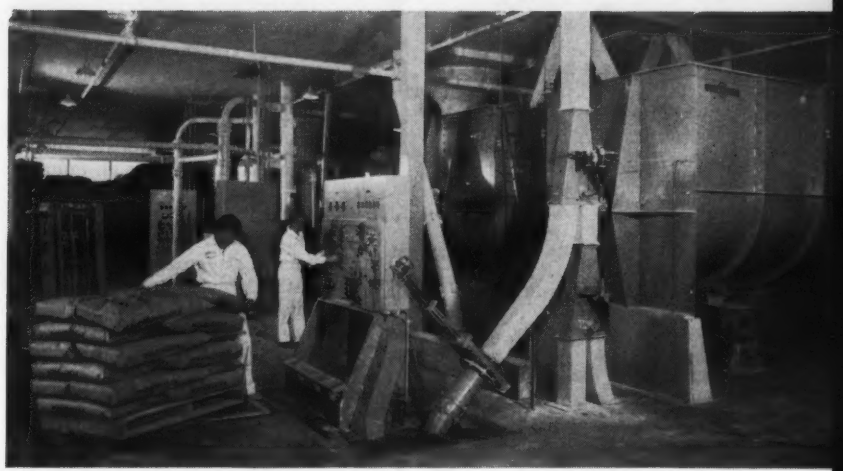

Fig. 2 Part of the automatic material handling system in a modern gum processing plant

Also investigation of new plant extractives and gums are going on all the time. For example, quite recently, a gum derived from okra, a widely-grown domestic vegetable, has become available. It offers interesting possibilities in soups, sauces and gravies because of its flavor characteristics as well as bodying properties. It can also be used as an emulsifying agent because of its excellent protective colloid action.

In Table IV, the natural gums discussed in the review and their applications in a variety of foods both liquid and solid are presented in a check-list. This chart is by no means definitive, but it is based on a general survey of the literature and the experience in our own laboratories.

The food processor has available for his use a number of natural gums, each with characteristics that fit it for specific purposes. Among the most important of the various categories of gums are those derived as plant exudates and plant seeds and the seaweed extractives (1, 2, 6).

Plant Exudate Gums

Arabic — Origin: Sudan; tree (Acacia verak). Structure: Neutral salt of a complex polysaccharide containing Ca, Mg, K. Flexible chain polyelectrolyte with a high degree of branching.

Gum Arabic, among the natural gums, remains unique because of its water solubility. While most water-soluble gums cannot form concentrations over 3 to 5%, arabic will, under ideal conditions, yield 50% solutions or over. The resultant solution will have a highly viscous gel-like consistency, which has all the characteristics of a strong starch-produced gel. Arabic, furthermore, is compatible with other gums as thickeners and binders. It is commonly used in soft drinks as an emulsion stabilizer and in beer as a foam stabilizer. In confectionery use, it prevents crystallization of sugar and as an emulsifier, it aids in the manufacture of gum drops and pastilles.

Another unique property of arabic is the fact that it has some hydrophobic properties. Thus it is used as a protective colloid and outer sealant in the process of spray-dried flavors, the so-called "locked-in" flavors. It is, in general, the easiest of all plant hydrocolloids to use and also the most moderately priced of all the natural gums. Arabic has recently become available in spray-dried and drum-dried forms.

Ghatti — Origin: Ceylon; tree

Table I Functions of gums in foods

Function	Foods
Thickener	Special jellies and jams, pie fillings, sauces
Stabilizer	Beer, mayonnaise type products
Swelling Agent	Processed meats
Water Absorber	Cheese, cheese spreads
Emulsifier	Dressings
Anti-Crystallizer	Icings, toppings
Jelling Agent	Confectionery items
Coating Agent	Confectionery items
Moulding	Gum drops, confectionery items
Encapsulation	Locked-in flavors

Table II Formulations of typical foods incorporating gums

French-Type Dressing		Emulsion (Concentrate)		Cream Cheese	
Salad Oil	74 lbs	Orange Oil Blend	10 oz	Cream (test 12%)	354 lbs
Vinegar (50 grain)	40 lbs	Brominated Oil	8 oz	Milk (test 3.5%) to yield	210 gal
Sugar	13 lbs	Gum Arabic	10 oz	Cheese Curd	700 lbs
Salt	2 lbs	Color	2 oz	Water & Cream	175 lbs
Paprika	1-½ oz	Water	98 oz	Salt	6-½ lbs
Spices	To taste			Gum Blend	2.2 lbs
Gum Tragacanth	11 oz				

Table III Physical and chemical factors determining gum selection

Physical	Chemical
Concentration requirements	Compatibility
Processing temperature	Precipitation
Dispersion medium	Buffering capacity
Salts	Anti-oxidant properties
Aging	Preservative requirements
pH of food product	Action of enzymes on food
	Titration values

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Natural Gums and Stabilizers continued

(Anogeissus latifolia). Structrue: Ca salt of ghattic salt.

Gum Ghatt is water soluble with thickening properties and characteristics between that of karaya and arabic. It has a completely bland taste and is odorless. If used as an emulsifier, one part of ghatti can replace two parts of arabic. Thus far, it has not found intensive usage in the food field in the United States but recent advances in gum refining techniques are causing increased interest in the gum.

Karaya — Origin: India; tree (Sterculia urens) Structure: High molec. weight partially acetylated complex polysaccharide.

Gum Karaya, in contrast to arabic and ghatti, is cold water-swellable. It also has extreme water-absorption and -adsorption properties. Karaya is valuable as a protective colloid. When cold water emulsification is necessary because heat would injure the other ingredients, karaya can be used to great advantage. Typical examples of karaya usage include sausage and meat binders, pie fillings, candy mints, ice pops, sherbets, etc.

Tragacanth — Origin: Iran; shrub (Astragalus). Structure: Complex polysaccharide in ribbon and flake form.

Gum Tragacanth has the extremely useful property of high resistance to hydrolysis by food acids. This characteristic is important in acid food products such as salad dressings, meat sauces and in natural fruit product items. Its low caloric properties makes it especially desirable in dietetic salad dressings. It is also used for chocolate milk stabilization and in cheese spreads and dips, especially those containing acidic ingredients, and in meringue and marshmallow processing.

Plant Seed Gums

Guar — Origin: India; seed (Cyamopsis tetragonoloba). Structure: Ground endosperm galactomannan.

Guar Gum, a cold water-soluble gum exhibits greater H-bonding activity than the other seed gums, and its greater number of side branches allow for easier hydration. As are the other natural gums, guar is non-ionic. It is suitable for use in canned foods, pie fillings, acid emulsions such as salad dressings, cheeses, cheese spreads, and foods that are flash pasteurized and retorted.

Locust Bean (Carob) — Origin: North Africa; seed (Ceratonia siliqua). Structure: Ground endosperm galactomannan.

Locust Bean Gum has the

Table IV Gum applications in food products

Food Product	Arabic	Guar	Trag	Locust	Karaya	Agar
Emulsions (Citrous Oils)	X		X		X	
Icings	X			X		X
Jellies			X			X
Salad & other dressings		X	X		X	
Beer	X					
Milk & Milk Drinks			X	X		X
Fruit Juices		X				
Sauces		X	X	X	X	
Soups		X		X		
Cheese		X		X		
Meats				X	X	
Pet Foods		X				
Ice Cream	X			X		
Pops & Water Ices	X		X		X	X
Confectionery Items	X			X		X
Dietetic Foods	X		X	X		
Flavors	X		X			

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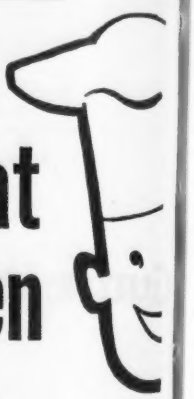

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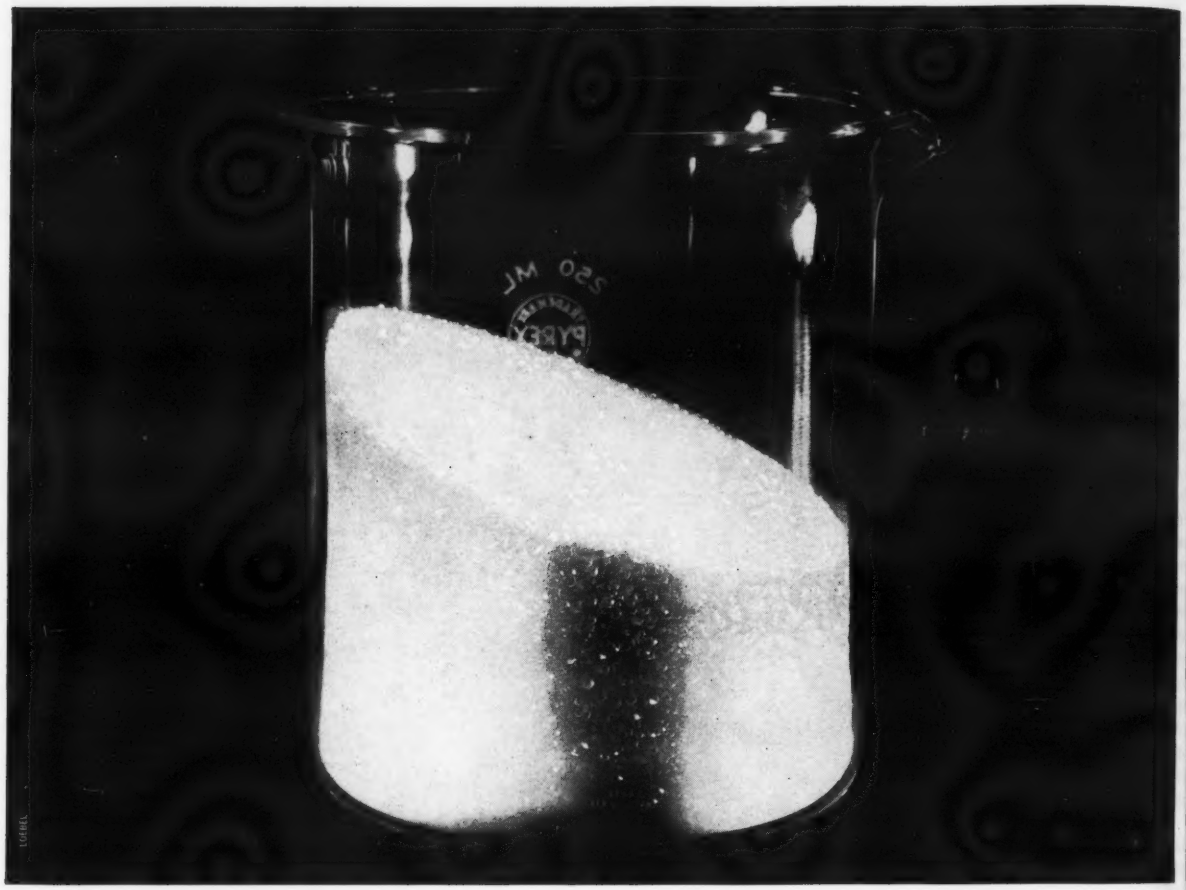

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"A STEP AHEAD IN SALT TECHNOLOGY"

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unique property of progressive thickening on standing over a period of weeks and months if the solution has not been heated. It can be used in conjunction with other gums to stabilize binding strength on aging. This versatile gum can also be heated in solution when it is necessary to reach the swelling point quickly. Locust bean gum is used extensively as an ice cream and baked goods stabilizer, and it is useful as a thickener in food products where extreme acid and alkali conditions do not exist and where cooking at elevated temperatures is normal procedure.

Seaweed Extractives

The most recent developments in the gum and stabilizer field include the seaweed hydrocolloids derived from the red and brown sea kelp found along the coastlines throughout the world. Among seaweed extractives, the most important to the food industry are agar, the algins and the Irish moss extractives. These display many common properties: they are all polysaccharides, and in general form anionic electrolytes with negative radicals on each repeating polymer unit. However, actual chemical structures are still murky.

Hot water is required to solubilize agar and the Irish moss extractives (carrageenins). In relatively high concentrations they will impart characteristic seaweed-like organoleptic properties. Agar, on the other hand, gels at low concentrations and is relatively bland. However, it does require boiling water to produce a gel on cooling.

For some unknown reason, agar is not affected by ions in solution, but divalent calcium and magnesium will precipitate the alginates and mono-valent potassium will gel the Irish moss extractives.

The seaweed extractives are all high viscosity producers. Use has been found for them in specific formulations such as chocolate milk emulsions, bakers' jellies, dressings, icings, toppings, etc.

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processed gums by the gum supplier is extremely important to the food processor, otherwise wide variations occurring in the natural gums will be reflected in their uses. A typical gum laboratory control report will list:

Color,
Viscosity (Brookfield, cps.),
Foreign Matter (%),
Moisture (%),
Mesh (U.S. St'd.),
Ash (5),
pH (2% sol.),
Gel Strength (grams/cm²),
Bacteriological
(Thermophiles, etc.).

In addition, specific constituents such as metallic compounds, protein, and fibre content as well as age of the gum must be taken into consideration by users who require uniformity of certain chemical properties for special reasons.

Literature Cited

1. Mantell, C. L. The Water-Soluble Gums. 1947. Reinhold Publishing Corp., New York, N.Y.
2. Whistler, R. L. ed., Industrial Gums 1959. Academic Press Inc.; New York, N.Y.
3. Staff of Ind. Eng. Chem. ed; Natural Plant Hydrocolloids. 1954. American Chemical Society, Washington, D.C.
4. Blumenthal, S., Food Products. 1947. Chemical Publishing Co., Brooklyn, N.Y.
5. Bennett, H., The Chemical Formulary. 1943. Vol 6. Chemical Publishing Co., Brooklyn, N.Y.
6. Smith, F. and Montgomery, R., Chemistry of Plant Gums and Mucilages. A.C.S. Monograph No. 141. 1959. Reinhold Publishing Co., New York, N.Y.

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The improved enzyme quickly digests soy bean hulls, barley gums, grape pomace, carboxymethyl cellulose and other cellulose materials.

Requests for more detailed information about Takamine 4000 should be directed to the supplier.

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Improves texture, appearance of weiners, franks, loafs

IN 1958, Western Dairy Products, Inc., at Petaluma, Calif., started a research program aimed towards developing methods of making a special nonfat dry milk for meat product uses.

The usual nonfat dry milk variables were produced by widely varying time, temperature and drying conditions. The samples thus produced were used in making comminuted meat products.

None of these variations resulted in any marked differences nor improvement in the meat products.

During the course of this work and quite by accident, it was discovered that moderate *increases* in calcium within the meat product formulations resulted in noticeable *decrease* in quality of the processed meat product.

The raw meat emulsion was rougher in texture, and it became clear that water-soluble calcium salts should not be included in meat emulsion formulations.

Since ordinary milk contains large amounts of soluble calcium, experimental work was immediately begun to reduce the calcium of milk by ion exchange, substituting sodium for portions of the calcium content.

The ion-exchange dried milk resulted in marked improvement in the smoothness, texture and body of the processed meat products.

This laboratory conclusion was confirmed by production runs in several large meat packing plants, where resulting products were judged by experts in the plants.

Texture, appearance and firmness of products made with 3.5% added calcium-reduced dried skim milk were noticeably improved over those with conventional dried skim milk. Products containing calcium-reduced milk solids were less greasy in their surface appearance.

Under the test conditions, all "fat capping" was eliminated. So-called fat caps can result in frankfurter type products when they are hung on racks for heat processing.

There is also preliminary indication that moisture loss during heat processing and shelf storage of comminuted meat products is less when the calcium-reduced product is used.

Meat Inspection Division of US Dept. of Agriculture has approved the use of the calcium-reduced dried skim milk in federally inspected meat food products on the same basis as nonfat dry milk.

Food and Drug Administration has allowed use of the name calcium-reduced dried skim milk to designate the product. Applications for USA and foreign patents have been made.

Full scale production, under the trademark name "Savortex", is scheduled to begin during May 1961 at Petaluma.

Additional plant installations are scheduled for the Midwest and East later in the year.

"Savortex" calcium reduced dried skim milk is a development of Western Dairy Products, Inc., 1399 Battery St., San Francisco 11, Calif.

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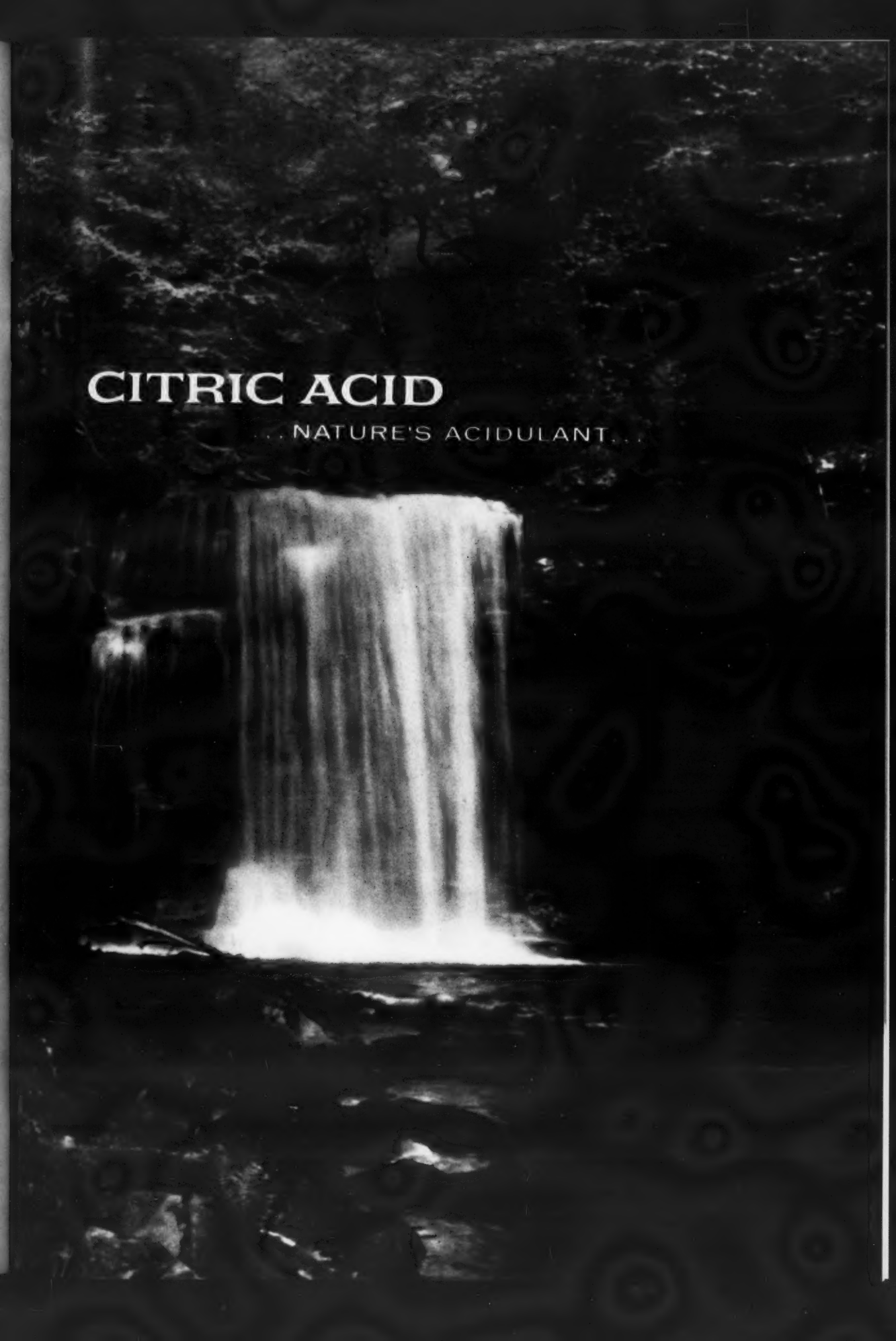
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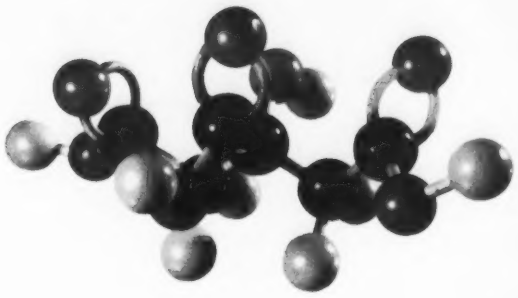

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Indeed, Pfizer Citric Acid has been a key product to the food industry for many years. The words "citric acid" on countless labels have established it as a familiar and trusted ingredient.

Don't gamble on quality and consumer acceptance with anything less than nature's acidulant —citric acid!

How Pfizer Pioneered in Production of Citric Acid in America

While the advantages of citric acid as a food ingredient have long been appreciated, the supply was at one time quite limited. Up until 1880, virtually all the citric acid used in this country was made in Europe. In that year, Pfizer conceived the idea of importing the raw materials from abroad and producing citric acid in the United States. The results were successful and Pfizer gradually became a leading manufacturer of this important commodity.

But production still depended on raw materials supplied from overseas. In a far-sighted decision around the turn of the century, Pfizer began to experiment with methods of producing citric acid from domestic materials. In 1914, this research program focused on the possibility of fermenting citric acid from a sucrose base. Five years later, Pfizer opened a pilot plant employing such a process.

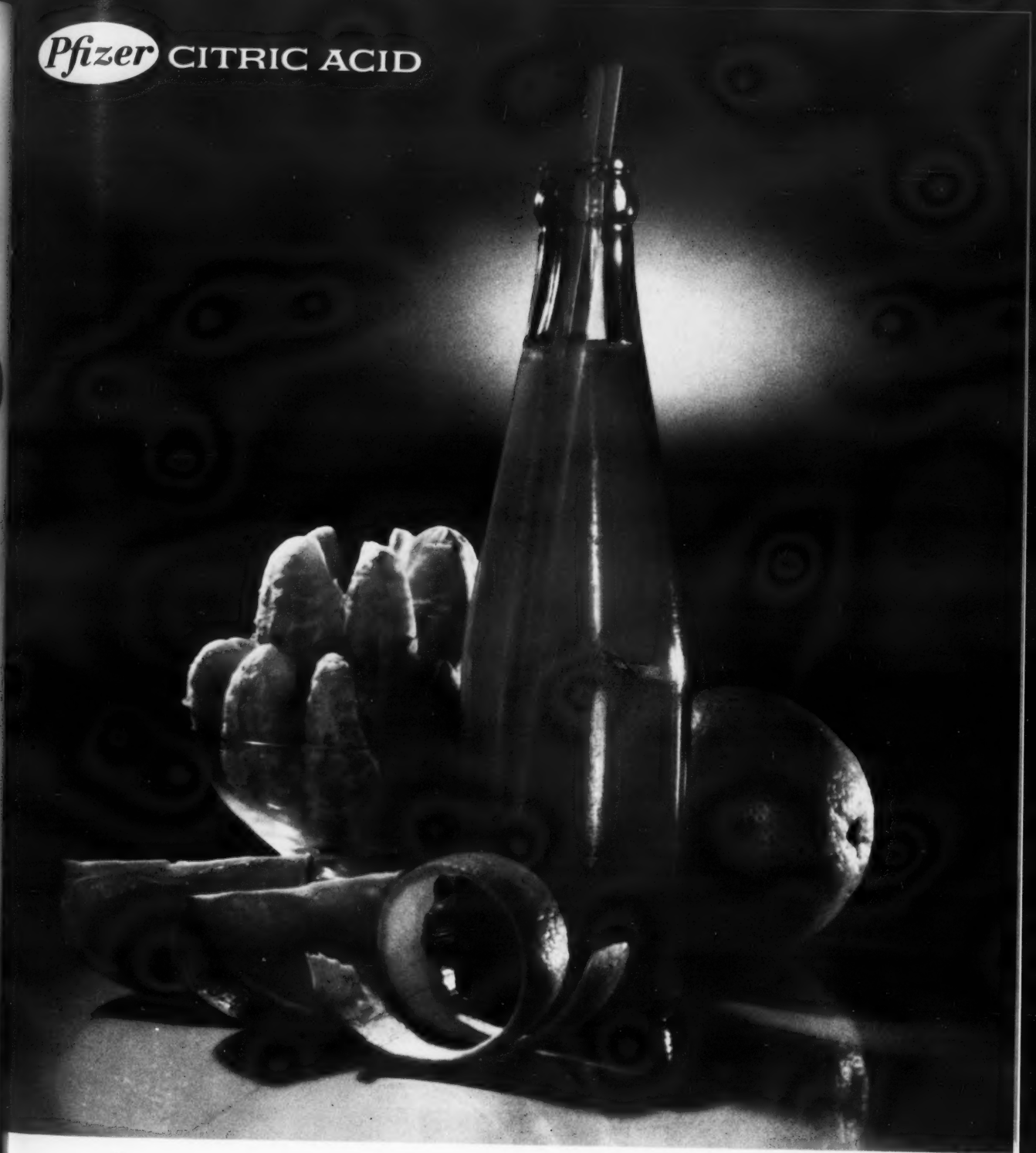
By 1923 the company was convinced that it had really found the formula for producing citric acid of the highest quality on an economical basis. A commercial production plant was put into operation and in 1924 American industry was receiving regular deliveries.

The Pfizer fermentation process proved so efficient that by 1939 the price of citric acid had been reduced to ⅙ the pre-World War I price!

The American food industry was thus assured a readily available supply of economical citric acid from a dependable domestic source.

In addition, by enlisting the assistance of the Pfizer Technical Service staff, customers have shared in Pfizer's extensive knowledge of citric acid and effected sizeable time and money savings in product development and improvement.

You will see on the pages that follow some of the products in which this versatile acidulant serves as a key ingredient—ample evidence of the importance of citric acid in today's food industry!



Nature's Acidulant

TRADITIONALLY BEST FOR SOFT DRINKS

Citric acid gives soft drinks an authentic, natural tanginess!

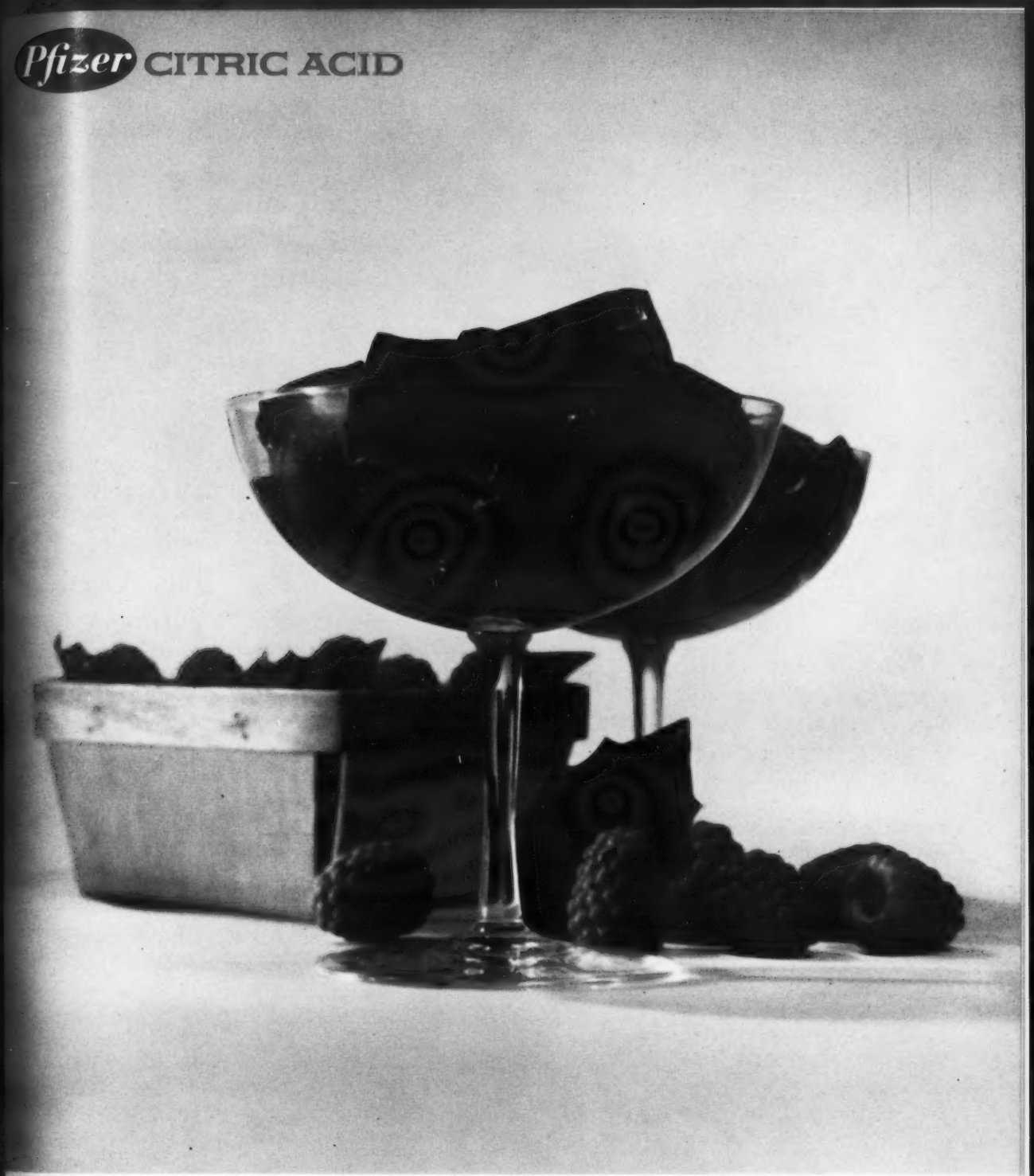
Pfizer CITRIC ACID

Nature's Acidulant

TRADITIONALLY BEST FOR CANDIES

Citric acid is the acidulant you'll use with absolute confidence!

Pfizer CITRIC ACID



Nature's Acidulant

TRADITIONALLY BEST FOR FRUIT-FLAVORED DESSERTS

Citric acid gives fruit-flavored desserts that natural tartness!

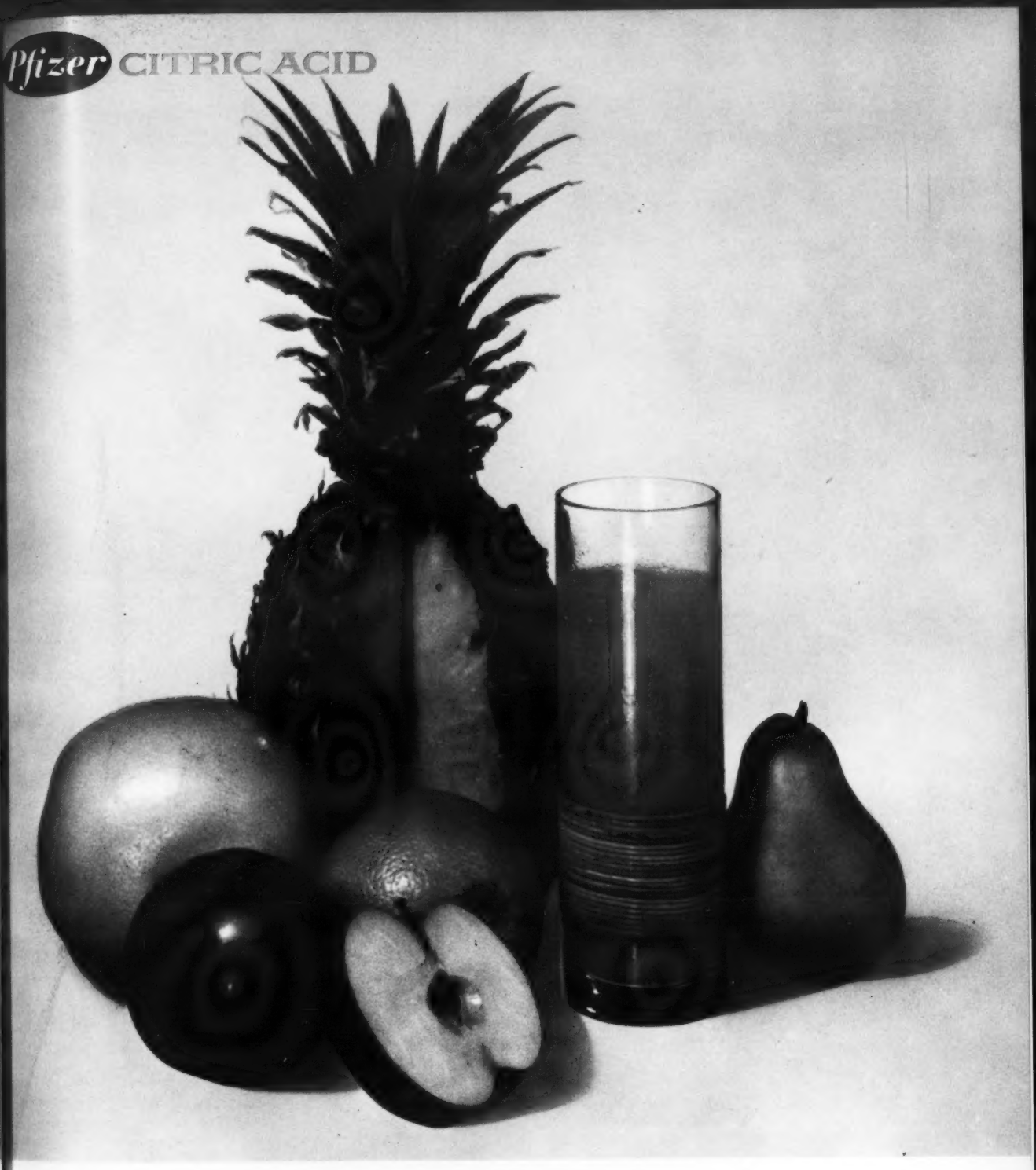
Pfizer CITRIC ACID

Nature's Acidulant

TRADITIONALLY BEST FOR ICES AND SHERBETS

Citric acid's flavor-benefit is that "little extra" so important to true fruit taste!

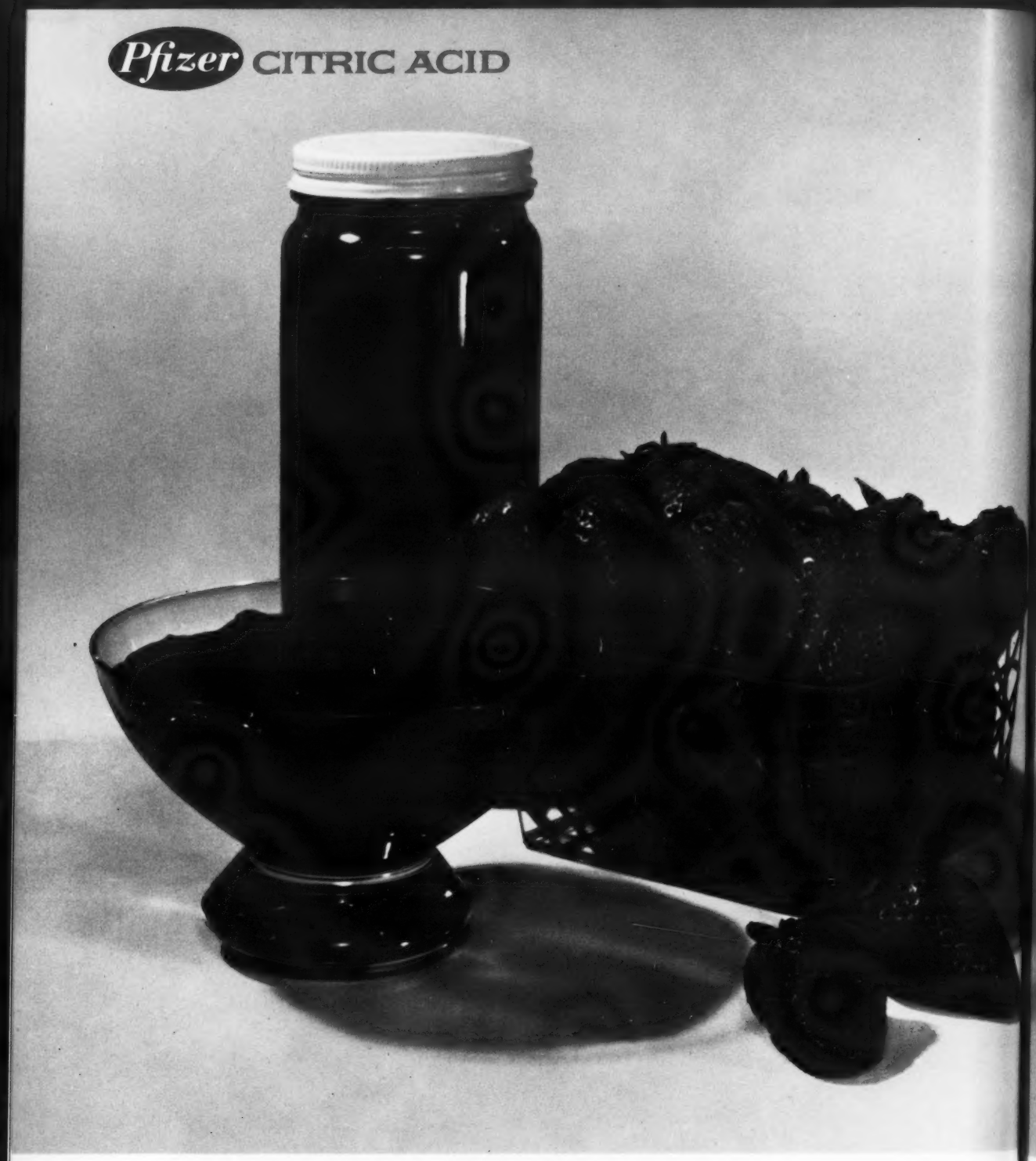
Pfizer CITRIC ACID



Nature's Acidulant

TRADITIONALLY BEST FOR CANNED FRUIT JUICE BLENDS

Citric acid gives a natural "lift" to real-fruit flavors!

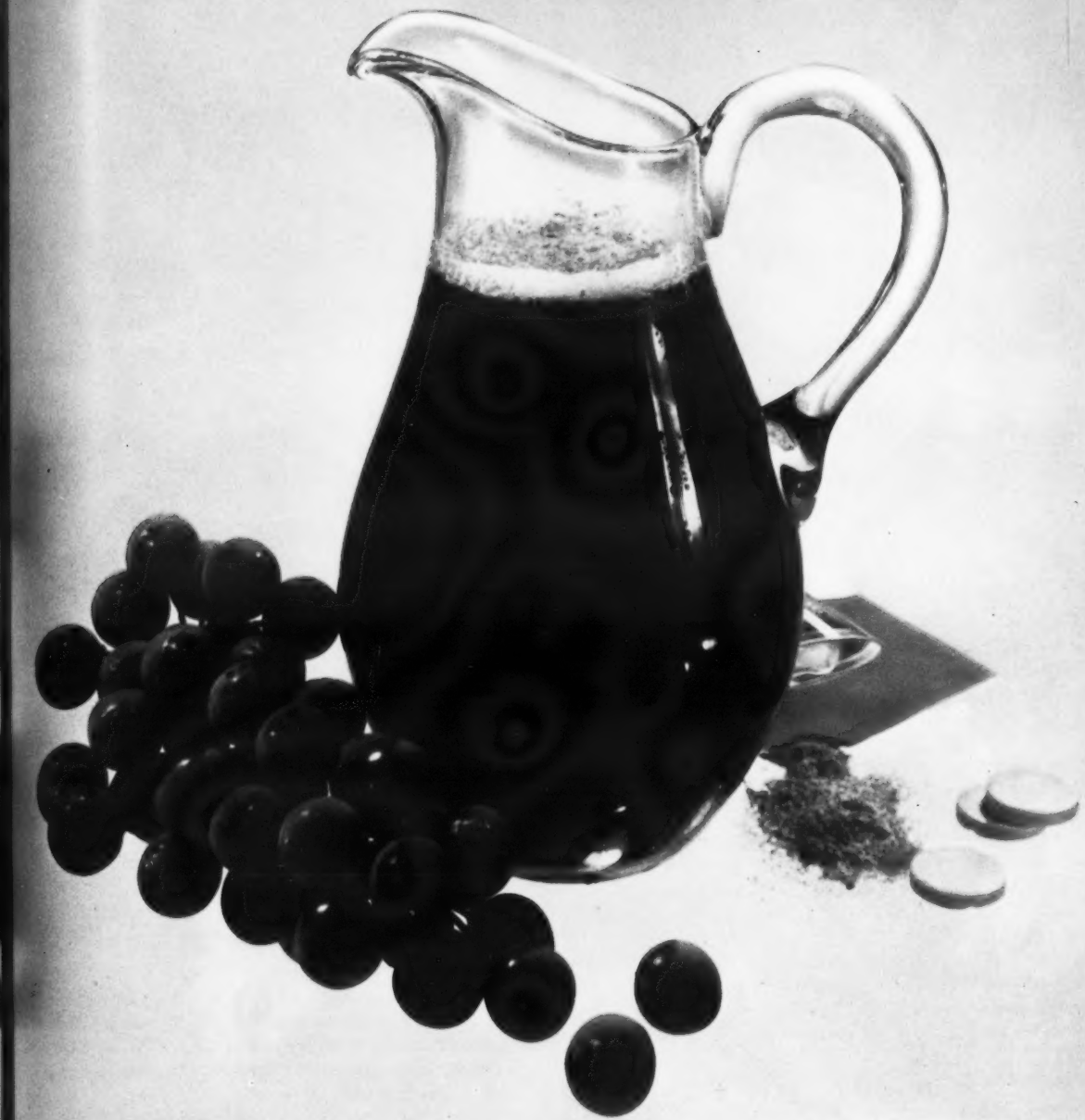


Nature's Acidulant

TRADITIONALLY BEST FOR FRUIT PRESERVES

Citric acid helps bring out the tart-sweet goodness of fresh fruit!

Pfizer CITRIC ACID



Nature's Acidulant

TRADITIONALLY BEST FOR BEVERAGE POWDERS

Citric acid adds the tanginess that contributes to full, rich flavor!

Pfizer CITRIC ACID

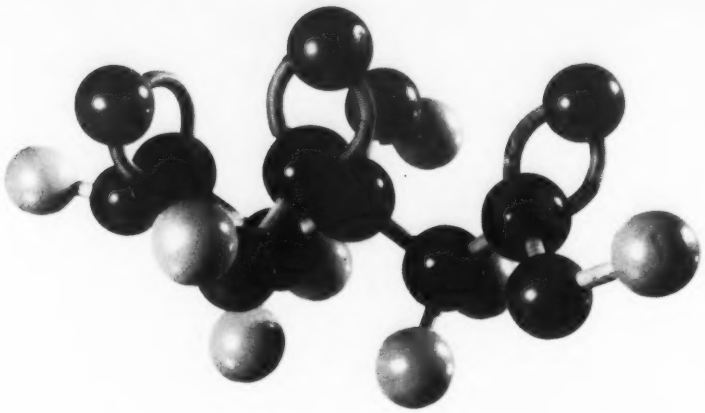
WHERE YOU MAY BE USING CITRIC ACID TOMORROW

In the future, uses for citric acid will extend beyond the area of fruit-flavored products. One area where citric acid may soon prove important is vegetables, particularly canned vegetables.

Small amounts of citric acid help control the pH level in canned tomatoes, beans, carrots and asparagus. Experiments in canned, whole tomatoes indicate that by controlling the pH with citric acid it may be possible to reduce processing time and/or temperature, resulting in a firmer whole tomato.

It has also been shown that citric acid sequesters trace metal contaminants in the pack, thus contributing to the quality of canned vegetables.

Pfizer, world's leading producer of citric acid, will continue to keep you informed on valuable new developments concerning citric acid—nature's acidulant.



Pfizer

CITRIC ACID

TECHNICAL INFORMATION

Pfizer offers citric acid in two basic forms—anhydrous and hydrous

CITRIC ACID, U.S.P., ANHYDROUS

This is produced as colorless, translucent crystals or as a pure white powder. It is odorless and has an acid taste. The compound is stable in the presence of light and air and resists caking under normal storage conditions. Because there is no water of crystallization present, anhydrous citric acid is particularly economical. Its reduced bulk leads to lower costs for handling, shipping, and storage. Furthermore, the lack of water of crystallization assures you of a uniform product and permits exact quality control.

CITRIC ACID, U.S.P., HYDROUS

This form of citric acid has been available for many, many years and is still counted on as a high quality acidulant for a wide variety of products. In physical appearance, taste and odor, it is similar to the anhydrous compound. However, it contains 1 mol water of crystallization (8.58% moisture). Stable in the presence of light and air, it will tend to lose water at high temperatures or in a dry atmosphere.

Various salts and esters of citric acid also find widespread application in the food industry. Two of the more prominent, sodium citrate and Citroflex® A-4, are described below.

SODIUM CITRATE

This sodium salt of citric acid is a versatile, easily assimilated product that has many uses in the food industry. Used as an emulsifier in cheese products, it produces smooth, even melting cheese that slices and spreads easily. Similarly, it improves the texture of ice cream. Pfizer Sodium Citrate acts as a buffer salt to control the pH in jellies, preserves, dessert powders, and canned fruit juice blends. And like citric acid, it also brings out true fruit flavor.

CITROFLEX® A-4 PLASTICIZER

Non-toxic, odorless, Pfizer Citroflex A-4 has been accepted by the Food & Drug Administration for use in packaging for both fatty and non-fatty foods. Citroflex A-4 (Acetyl Tributyl Citrate) shows excellent results in plasticized vinyl films for meat wrapping, vinyl coating for food containers and hot drink cups, and vinyl plasticizers for food jar liners and sealing rings. In addition, Pfizer Citroflex A-4 is excellent in polyvinyl acetate adhesives. Low in cost and high in performance Pfizer Citroflex A-4 is finding wide use in plastic coatings for the food industry.

PHYSICAL PROPERTIES OF PFIZER CITRIC ACID

	Anhydrous	Hydrous
Formula	$C_6H_8O_7$	$C_6H_8O_7 \cdot H_2O$
Molecular Wt.	192.12	210.14
Density	1.67	1.54
Melting Point	153°C	Loses water
Solubility, 25°C		
Water	161.8 gm./100 ml.	208.6 gm./100 ml.
Alcohol	59.1 gm./100 ml.	90.4 gm./100 ml.
Ether	0.75 gm./100 ml.	1.6 gm./100 ml.

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Future trends

- **Diet energy value to decrease**
- **Nutritional value to increase**

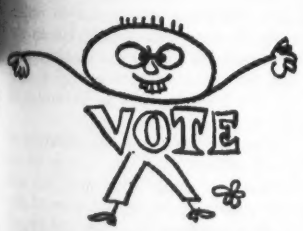
Current studies on the health hazards of obesity suggest that the energy value of the diet will decrease, that less fat will be consumed, and that possibly more unsaturated as compared to saturated fat will be included in the diet.

More foods probably will be enriched with vitamins, minerals, and amino acids to produce products of higher nutritive value. It is hoped that this program will be conducted wisely in accordance with demonstrated needs and potential benefit.

Dietary habits change slowly. Nevertheless, the nearness of all parts of the world in this era and modern media of communication should speed up the process.

Radio and television can have a profound influence in nutrition education, allowing more rapid acceptance of current and future knowledge for the benefit of health.

(The preceding commentary on future trends in American Diet was taken from the statement of Dr. Grace A. Goldsmith, Professor Medicine, Tulane University School of Medicine, that appeared in the *Journal*, Stanford Research Institute, First Quarter, 1961.)



See this month's "FP Hall of Fame Cartoon" on page 178, and then vote for large reproduction of your favorite on the Reader Service Slip.

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Urge shift to polyunsaturated fats

Who? The "enthusiasts" named in our February issue

Why? See replies of Drs. Keys, Jolliffe, and Kinsell

. . . also an interpretative commentary by Dr. Page, Chairman of the American Heart Association's Ad Hoc Committee on Dietary Fat and Atherosclerosis

Irving H. Page, M.D.,
Research Division, Cleveland Clinic, Cleveland, Ohio

I HAVE READ your editorial and Dr. King's review with interest. It must be quite apparent that most of the problem now is one of emphasis. Those that you label as "enthusiasts" simply push harder than the rest.

Any wise person realizes that rigorous proof has not been offered that fat is *the* cause of atherosclerosis. I'm sure it never will be. It is probably *a* cause. Obviously there is no strict causal relationship between cholesterol levels in the blood and atherosclerosis. But there is certainly an association.

You see, to me, the questions are put wrongly and largely answered wrongly. I am afraid even your so-called experts very often are either "committee experts" or have spent too much time in Washington.

But airing all these facets is good. Our problem is to get on with the job of proving or disproving the "fat notion" by showing a reducing of heart attacks. The world really doesn't care too much what we self-styled experts and professors think. They only will care very much after we have done something and then they will forget who did it.

Norman Jolliffe, M.D.,
Director, Bureau of Nutrition, Dept. of Public Health, NYC

YOU ASKED FOR my comments on your article on the shift from solid fats to edible oils in the February 1961 issue of FOOD PROCESSING.

I must say that you are doing a magnificent job in fighting a losing rear guard action. I am extremely complimented by being included in the group of "enthusiasts" such as Ancel Keys, Laurance Kinsell, Jeremiah Stamler and Hugh Sinclair. These are all fine scientists of the highest standing. You should have also named the "top-notch" authorities.*

Laurance W. Kinsell, M.D., D.Sc.,
Director, The Institute for Metabolic Research, Highland-Alameda County Hospital, Oakland, California

YOUR EDITORIAL in the February 1961 issue of FOOD PROCESSING I find interesting. I am sure that you will be good enough to amplify the sentence, "They are impatient with the rigorous demands of the top-notch authorities who demand scientific proof." Will you be good enough to publish the names of these authorities and cite their specific statements.* Since many "authorities" have changed their opinions rather radically within the last year or two, I would suggest that you confine quotations to a period of the last fifteen months.

Perhaps it might be in order to define what I believe is the position not only of the "enthusiasts" but of the great majority of people who are seriously concerned with the entire problem.

1. Nearly 100 per cent of the people with precocious coronary artery disease, that is, with coronary artery disease occurring under the age of forty-five, have elevated blood lipids.

2. The evidence is overwhelming that the intake of foods containing predominantly saturated fats elevates blood lipids.

3. The evidence is equally overwhelming that the intake of food containing predominantly polyunsaturated fats will lower blood lipids.

4. The intake of large quantities of polyunsaturated fats to some degree at the expense of saturated fats is compatible with excellent nutrition, assuming, of course, that the diet is otherwise properly constituted.

5. Many years will elapse before anyone has the full answer to the entire problem of atherosclerosis.

6. In the meantime it makes elementary horse sense to recommend a dietary program which will maintain a low rather than a high level of blood lipids.

With regard to the "increased need for Vitamin "E", essentially all of the studies which have been done which have demonstrated E deficiency, in association with intake of unsaturated fats have been done with stripped oils, that is, oils in which the natural Vitamin E has been removed. The amount of Vitamin E necessary to prevent E deficiency is essentially without exception less than the normal amount of Vitamin E which these oils contain.

To eliminate any worries on this score, most of us who employ diets containing large amounts of polyunsaturated fats recommend that our patients consume additional sources of E, a very simple and inexpensive matter indeed.

Some hold the view that it is debatable whether for patients with coronary thrombosis polyunsaturated fatty acids are a suitable replacement for saturated fats since they may facilitate deposition of cholesterol in atherosclerotic plagues. As we all realize, in human subjects absolute information concerning this is not at hand, because one cannot cut his human patients into little pieces at intervals and take a look.

In our own experience, more than five years of observation of several hundred patients maintained on diets containing quite large amounts of polyunsaturated fat would certainly not lead us to believe that we have accelerated the course of their vascular disease. If we cared to believe what many of the patients themselves believe, quite the opposite would be the case.

I think that the only proper point of view in this regard is that the long-term very adequately controlled study will be the one to supply the proof. Such a study is now in its early phases.

Discussions on this subject eventually lead to the question: What specific recommendations do we make to the food industry at the present time? My recommendations follow:

1. Significant modifications of hydrogenation procedures in such a way as to increase the percentage of cis-cis linoleic acid and decrease the percentage of saturated acids and tran acids in shortenings and margarines. Perhaps a reasonable objective for the present would be an absolute content of cis-cis linoleic acid of 30 per cent or above and a ratio of cis-cis linoleic acid to saturates of perhaps 1.4 or above.

2. Consideration of modification of stock feeding in such a way as to decrease the total amount of fat and where possible, as in the case of the hog, to increase the percentage of linoleic acid in the fat.

3. An intensive program of experimentation by components of the dairy industry designed to produce modified cheeses, milks, and creams not devoid of butterfat but containing part dairy fat and part vegetable

* See facing page.

fat, again with the objective of a ratio such as noted above.

We have carried out studies ourselves with modified eggs in which the linoleic acid content of egg yolk has been increased from approximately 10 per cent to nearly 40 per cent by appropriate modification of the diet of the hen. Unfortunately, the cholesterol levels with both types of yolk are little if at all different. This would seem to mean, therefore, that such change in the diet of hens is not a particularly rewarding procedure in terms of the over-all objective of lowering plasma lipids. It probably means that for general purposes eggs should be included in the diet in moderation.

In closing I should like to take the liberty of speaking for the "enthusiasts" to the effect that no one of us feels that we have anything approaching the final answer. By the same token, if one looks over the entire field of clinical medicine, final answers are rare birds indeed. Most of the things that conscientious physicians recommend to patients are those things for which there appear to be more points in favor than against. It is with this philosophy in mind that the preceding statements and recommendations are made.

Ancel Keys, M.D.,
Director, Laboratory of Physiological Hygiene, University of Minnesota

YOUR EDITORIAL, "Shift from Solid Fats to Edible Oils?" (FOOD PROCESSING, Feb., 1961), distinguishes between "top-notch authorities" and "enthusiasts" who "make headlines more frequently than the conservative top-notch scientists". I assume the latter are not represented in the memberships of the Central Committee or the *Ad Hoc* Committee on Dietary Fat and Atherosclerosis of the American Heart Association which prepared and approved the AHA report which displeases you. The membership lists of these two committees are appended for the information of your readers (page 153).

As a member of both of those AHA Committees, and the first person named on your list of the "enthusiasts," I should like to clarify my own position and to remark on a few points in your editorial and the accompanying piece, "Research on Fats Progresses".

My position, which I still maintain, was clearly stated in the book *Eat Well and Stay Well* (1959, Doubleday and Co., New York):

continued on page 146

Members of a panel discussion on "Lipids in Health and Disease" at the Fifth International Congress on Nutrition, in Washington, D. C., included (l. to r.) **Dr. G. S. Boyd,** Department of Biochemistry, University of Edinburgh, Edinburgh, Scotland; panel moderator, **Dr. K. Lang,** Physiologisch-Chemisches Institute, Johannes Gutenberg University, Mainz, Germany; panel chairman, **Dr. Ancel Keys,** Director, Laboratory of Physiological Hygiene, University of Minnesota, Minneapolis, Minn.; **Dr. B. Bronte-Stewart,** Department of Medicine, University of Cape Town and Groote Schuur Hospital, Cape Town, South Africa; **Dr. W. Stanley Hartroft,** Chairman, Department of Pathology, Washington University, School of Medicine, St. Louis, Mo.; **Dr. Sune Bergstrom,** Karolinska Institutet, Stockholm, Sweden; and **Dr. A. C. Frazer,** Department of Medical Biochemistry and Pharmacology, University of Birmingham, England

In our February issue in discussing the fats and heart disease controversy we contrasted the position of the "enthusiasts" with . . .

The "top-notch authorities"

Six of the "top-notch authorities" whom we were referring to in our February issue, and whom Drs. Jolliffe, Kinsell, and Keys question, are shown in the above photo along with Dr. Keys. Dr. Keys should remember the occasion — the Fifth International Congress on Foods and Nutrition, September, 1960. He served as chairman of the Panel on Lipids in Health and Heart Disease, and helped our photographer get all his group together.

Our report on this panel appeared in our October issue under the heading "Nutrition Experts from All Over the World Say it's Premature to Condemn Fats as Cause of Heart Disease." Typical of the views expressed were those of Dr. B. Bronte-Stewart who examined the facts of what he called a **triple association:**

"There is much evidence to suggest that atherosclerosis is the algebraic product of time and a disordered fat metabolism. There is much evidence, too, to suggest that this disordered fat metabolism arises from dietary causes. The hypothesis in its simplest form suggests that an imbalanced diet with regard to fats or some factor closely associated with dietary fats leads, over a course of time, to a disordered fat metabolism resulting in atherosclerosis which is expressed clinically by certain effects — perhaps most strikingly as ischemic heart disease . . . . [characterized by a temporary cut-off of the chief blood supply].

". . . . In this triple association there is strong evidence for a direct relationship between the diet and serum cholesterol trends in man, but the strength of the other links depend on certain assumptions which, as yet, have not been established as fact. **It has yet to be shown that these dietary effects on the serum lipid levels have any bearing on the degree of atherosclerosis, and secondly whether or not there is justification for the assumption that atherosclerosis and ischemic heart disease bear a cause-and-effect relationship.**" (Emphasis supplied)

Dr. Hartroft summed it up this way: "It is currently popular to suspect the quantity and kind of dietary fat consumed by man . . . These hypotheses are stimulating to the clinical investigator and basic medical scientists alike, but applications of theories to the extent of drastically altering our dietary habits must await that time when every reasonable doubt of the truth of these concepts has been removed. That day is far off."

At this scientific panel session we approached Dr. Keys for a statement anticipating that he would take issue with the conclusions of the members of his panel. But he was reticent to say anything more than that there was a lot of interest in the subject. His reticence on this occasion is to be contrasted with the detailed argument for his position which he makes (see adjoining column) in answer to our classifying him as an "enthusiast."

We hasten to explain that the designation of "enthusiast" or perhaps we should say "scientist-enthusiast" is not meant to be derogatory in any way whatsoever. It is a term we used to help explain to our readers in the food processing industry why confusion continues in this matter. Thus, on the one hand we have physicians making recommendations to their patients and the general public based on facts and hope; on the other, we have the scientists — the "top-notch authorities" — arriving at conclusions based on facts and proof.

HOWARD P. MILLEVILLE
EDITOR

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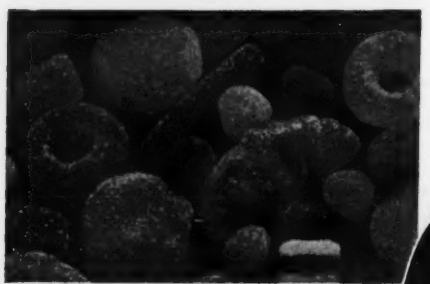

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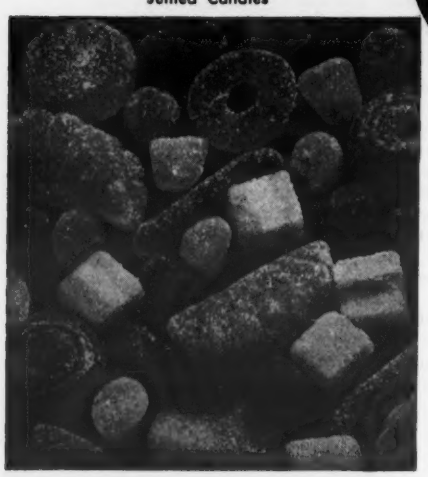

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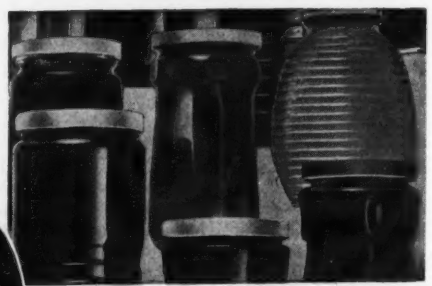

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"We are well aware that full knowledge of these questions is not yet at hand," but "we share the conviction of a great many medical scientists that control of the cholesterol and related lipids in the blood must have an important effect on the tendency to develop atherosclerosis. And we do know that a large measure of control of the blood cholesterol is now easily and safely at hand through dietary adjustment" (p 5). Further, "We do not propose to lead a campaign to persuade everyone to change his diet . . . These menus and recipes are not guaranteed to save you from coronary heart disease. But they should keep your blood cholesterol at a more favorable level than an uncontrolled diet" (p 15).

The principles of the diet offered in this connection are: 1) Use a wide variety of foodstuffs providing abundant proteins, vitamins and minerals to assure good basic nutrition. 2) Control total calorie intake so as to prevent or correct overweight and obesity. 3) Restrict total fats in the diet to under thirty per cent of the total calories thus reducing the intake of saturated fats that tend to raise the blood cholesterol level. This restriction also reduces the calorie density of the diet (few calories per bite) and lessens the peak of lipemia after meals. 4) Give preference to less saturated as contrasted with more saturated fats in the diet, thereby lowering the blood cholesterol level further.

This diet is recommended for adults who wish to control obesity and the concentration of cholesterol in the blood. I submit it is irresponsible nonsense to suggest that such a diet may have far-reaching and even dangerous side effects.

I do not propose to tell the public what they must or must not eat but the available facts should be known so that informed choices may be made. And I do not accept as a fact the propaganda that every adult needs to drink X many glasses daily of whole milk (containing not less than 3.5 per cent butterfat).

No one has claimed that fats in the diet or the cholesterol level in the blood are the only factors in the development of atherosclerosis and its clinical complications. But is is a strange kind of logic that concludes that the diet and the blood lipids must be unimportant in atherogenesis because age, sex, and heredity are influential, lack of exercise may play a role, and heavy cigarette smokers may be more prone to heart attacks than non-smokers.

Your "top-notch scientists" agree

that overweight increases the risk of coronary heart disease. Yet the evidence is that this factor is much less important than the blood cholesterol concentration, a fact that escapes your top-notchers and others who are unaware of the findings in the major follow-up studies in Minnesota, Massachusetts, New York, and California. Thousands of men, examined with scientific care and found clinically healthy at the outset have been re-examined periodically from seven to thirteen years in these studies. Hundreds of them have now suffered myocardial infarcts or died from coronary heart disease.

Each of these independent researches has produced substantially the same findings. When men of given age in the same population are divided into the upper and the lower halves of the relative weight distribution, the subsequent health experience shows little or no significant difference in the incidence of new coronary heart disease. Only at the top end of the scale, among the small fraction of the men who were most extremely overweight, is there evidence of increased risk, associated with overweight.

Comparable analysis of the subsequent health of the men classified according to their blood cholesterol levels measured in "health" gives a more impressive difference. Roughly, in all of these studies the men in the upper half of the blood cholesterol distribution later proved to have about three times more heart attacks and sudden death from coronary heart disease than experienced by the other half of the men.

The median cholesterol value, the cutting point between the lower and the upper half of the middle-aged men in these large-scale studies, varied in the different groups from 225 and 240 mg of cholesterol per 100 ml/blood serum. Above those levels the risk is tripled as compared with the risk below those levels. When mathematical analysis is applied to the data from these studies the result is that the risk of future coronary heart disease rises almost as the cube of the cholesterol level.

These results agree with our findings in surveys of prevalence of heart disease in different populations. In those studies on many populations around the world differences in the average serum cholesterol levels of those populations are accompanied by marked differences in the frequency of finding electrocardiographic evidence of myocardial infarction in the living population as well as in

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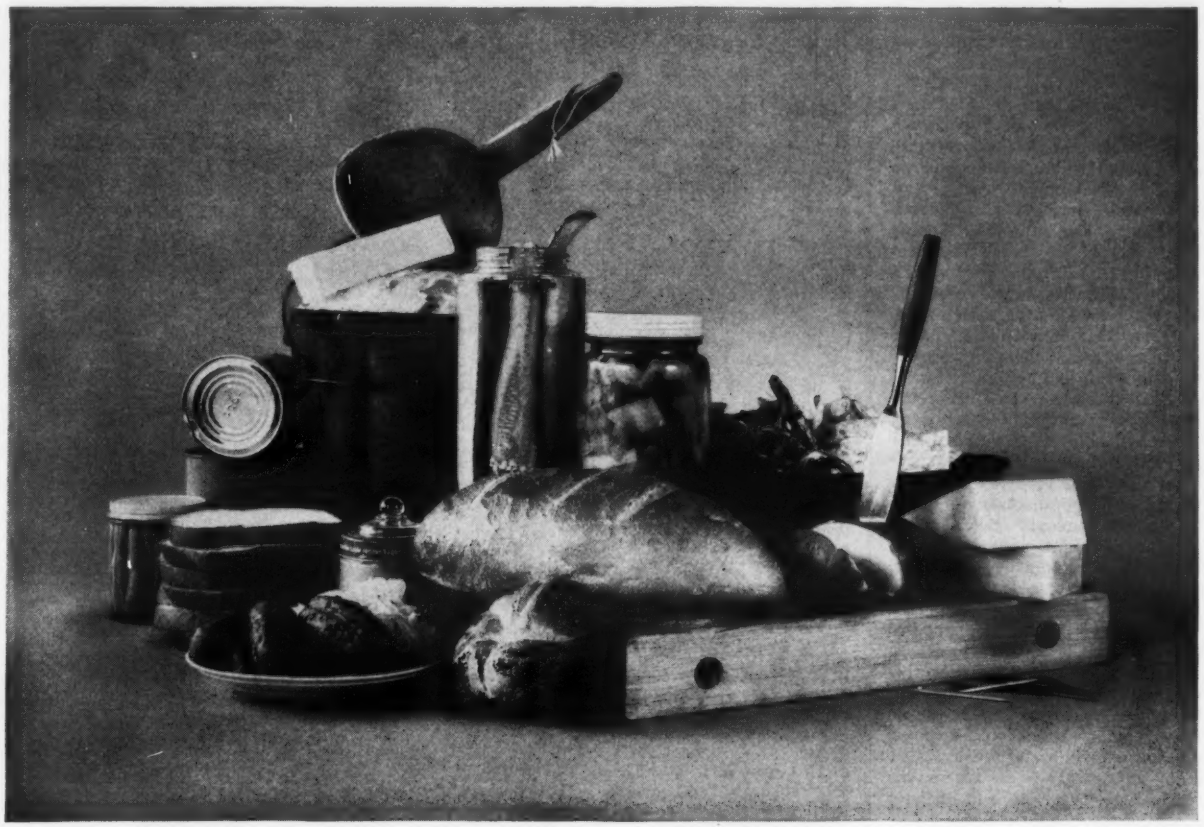

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the reported mortality rates in the vital statistics. And the average serum cholesterol levels, in turn, correspond to predictions, derived from controlled dietary experiments, from the fat composition of the average diets of those populations.

What happens to the incidence of heart disease in populations when the dietary intake of saturated fats is drastically reduced (as in Finland, Norway, the Netherlands during World War II, or in Germany somewhat later), or increased (as among Japanese migrating to Hawaii and to California, Neopolitans and Sicilians migrating to Massachusetts, Yemenites moving into Israel)? In all of these cases other features in the mode of life besides the diet changed but one feature was common to all. On higher fat diets the incidence of myocardial infarction and death from coronary heart disease is much higher than in the same populations on lower fat diets. Moreover, when other features in the mode of life changed without major alterations in the diet, as in England and Denmark during World War II, no such alterations in heart disease resulted. Increased work, lack of cigarettes, shortage of fuel, the stress of war and occupation by foreign soldiers, did not result in fewer heart attacks unless the consumption of fats was also changed.

This is not the place to analyze in detail the article, "Research on Fats Progresses" [Dr. E. G. King, FOOD PROCESSING, Feb., 1961] but your readers should consider a few points. The article states that there is "substantial evidence that a calorie intake from fats is optimal when in the range of thirty to forty per cent of total calories". What and where published is that evidence? We are talking about adult man.

The article implies that the experience of Eskimos on "diets very high in fat content through thousands of years" exonerates the saturated fats, though it is admitted that "vital statistics for such groups are relatively inadequate." If there are *any* vital statistics for such groups they should be made known. How many Eskimos living on the old primitive high fat diet attain even the modest age of fifty years? And how much of our type of saturated fat — butterfat, the fats of beef, pork and lamb fat— do they (or did they) eat?

The article indicates that, besides dietary fats, consideration should be given to experiments showing that arteriosclerosis can be induced by "low intakes of

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choline or methionine or vitamin B_6 or magnesium, and high intake of calcium, phosphate, moderate intakes of bile salts, large quantities of cholesterol and excess intake of calories". Except for excess calories, is there any evidence at all that these other factors play any role in the production of arteriosclerosis and coronary heart disease in man on any natural diet?

It is stated that "our average adult, for example, is about 15 pounds above his ideal weight." Perhaps so, if the "average adult" includes only persons from 40 to 60 years old and "ideal weight" is arbitrarily defined, as it was by the Metropolitan Life Insurance Company that coined the term, to be the average body weight of policy holders at age 25. Incidentally, years ago the Metropolitan Life Insurance Company changed the term "ideal" to "desirable".

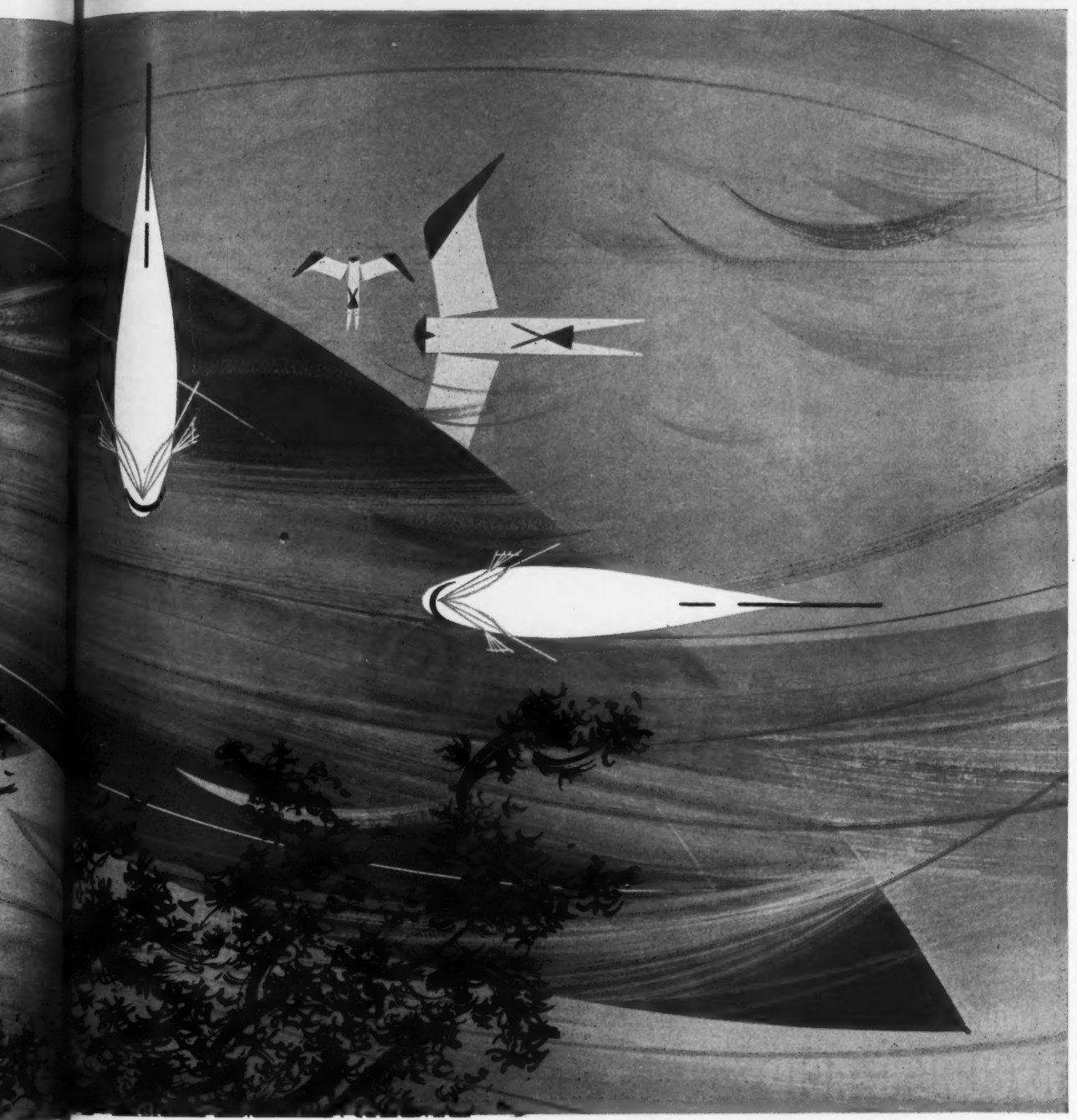
In general, Americans, and other peoples, continue to gain weight, i.e., fat, for many years after skeletal growth has ceased. There is no obvious reason why this should be beneficial and insurance experience indicates that the risk of early death from many causes, including accidents, is increased among persons who greatly exceed the average body weight of persons of the same age and height.

But there is practically no evidence that *obesity*, or excess fatness, is the real cause of this excess mortality. Obesity and overweight are not identical though they are correlated at the extreme end of the scale. There *is* ample evidence to show that simply being in the non-overweight class gives very little protection against heart attacks. Nevertheless, we join in deploring obesity.

There is no doubt that, as you say, "confusion continues". The contribution to this confusion by the broadcast opinions of your "top-notch scientists" is not inconsiderable. By the way, just who are these Olympian authorities, these eminent cardiologists, these experts on human lipid metabolism, these devoted researchers in cardiovascular epidemiology? No doubt they have made many careful comparisons between coronary patients and "healthy" controls, they have long conducted controlled dietary experiments on significant numbers of men and have made many surveys on populations. But who are these paragons and what facts have they published?

Your readers would do well to consider the history of the great advances in public health.

When would steps have been



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taken to control small pox and tuberculosis if conservative skepticism had prevailed to obstruct application until the ultimate proof of cause and effect and the details of mechanism were at hand? What reason is there to be concerned with a diastolic blood pressure of 90 or 95mm and what justification is there to reduce it? The analogy with a serum cholesterol level of 250 mg per 100 ml is close, except that the attendant risk seems to be greater in case of hypercholesterolemia.

Uncertainty remains. It has not been proved that reducing, by dietary or any other means, the serum cholesterol concentration to 200 mg from a previous level of 250 will thereby reduce the risk of heart attacks to that of the person who has always had a cholesterol level of 200. But knowing the facts outlined here, a good many people will prefer the lower cholesterol level for themselves.

Some "enthusiasts" believe it proper to let these facts be known. *Then,* as stated in *Eat Well and Stay Well* (p 15), "If your logic and personal bias and the best advice you can get elsewhere leads you to agree with our conclusions," you may go about adjusting your diet.

Many people, including a large segment of the medical profession, are concerned with these questions. Let us hope that individual conclusions can be arrived at with less hindrance by entrenched interests and the confusion created by commercial competition. And, I should add, we could do with fewer pontifical opinions from arm-chair and other "top-notch authorities" who have personally done little or no research in this field.

EDITOR'S NOTE: Dr. Keys' closing remark no doubt is in reply to my article last February classifying him as an "enthusiast . . . impatient with the rigorous demands of the top-notch authorities who demand scientific proof."

Although we named five whom we would include as "enthusiasts" we did not identify any of the "top-notch authorities". Those whom we would so classify are indicated on page 145 this issue. Note that the six we name were members of Dr. Keys' Panel on Lipids in Health and Disease at the Fifth International Congress on Nutrition held last September. Dr. Keys presented them as "Ex-

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Also, we are sure that any opinions that Dr. King expressed in his review of research progress in the February issue of FOOD PROCESSING are based on studies of such researchers.

Members of the committees referred to at the beginning of Dr. Keys' statement are listed below.

H.P.M.

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Ancel Keys, M.D. (U. of Minnesota)
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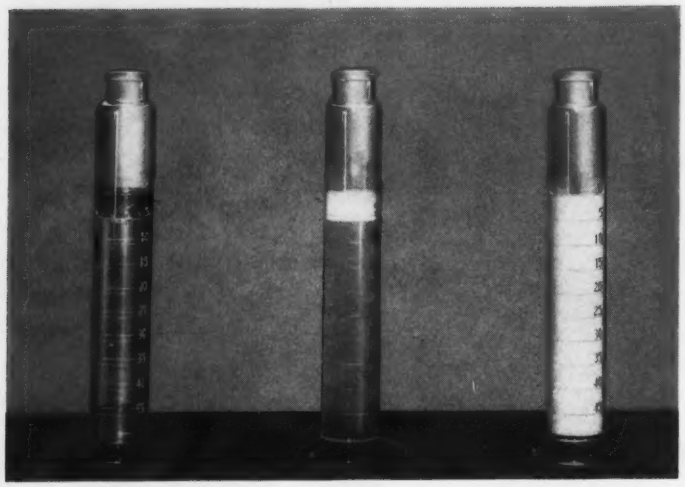


SOYA OIL WITHOUT EMULSIFIER	SOYA OIL WITH MONO- AND DI-GLYCERIDE	SOYA OIL WITH TEM

Fig 1. **Mixtures of soya oil and water with and without emulsifier after one inversion of the cylinders. The mono- and diglycerides form a W/O emulsion; hence, the amount of water that can be carried by the dispersed phase is limited. TEM forms an O/W emulsion, where water is the continuous phase; hence, the emulsion can be readily diluted with water as shown in the third cylinder.**

THE USE OF emulsifiers in baking technology is desirable because the formulae for commercial white bread include, among other ingredients, water and shortening. It is known that water and fat are neither miscible nor are they soluble in each other, but by emulsification, these two ingredients can be combined.

Although more than 2600 surface-active agents are commercially available, the baking industry which has a yearly bill of more than 150 million dollars for fats and oils, is limited to three emulsifiers by the Federal Standards for Bread and Rolls. These Standards regulate the mandatory and optional ingredients for bread and rolls, sold in interstate commerce.

The three classes of emulsifiers permissible and optional under the Standards are: (1) Lecithin and its associated phosphatides; (2) Mono- and diglyceride of fat forming fatty acids; (3) Diacetyl Tartaric Acid Esters of Mono- and Diglycerides of fat-forming fatty acids (referred to commercially as TEM). It is interesting to note that all of the permitted emulsifier can be considered as glycerides or their derivatives.

Of the three emulsifiers listed, lecithin has been in commercial use in the United States since about 1930 and it was the first emulsifier to be utilized in bread baking. The amount of lecithin recommended for use in bread is small, namely, 0.25%, based on the flour weight.

The addition of lecithin improves the dough handling properties, and the finished bread possesses a more tender crust, finer grain and texture, more symmetrical appearance and better keeping qualities than loaves baked without the addition of lecithin.

Although monoglyceride has been known in the laboratory for almost a century, the initial use as a food additive did not occur in the United States until after 1929.

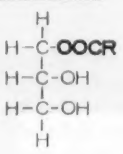
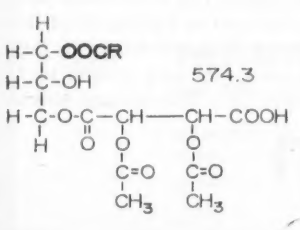
The incorporation of monoglyceride into white bread has merit. Such loaves are taller and of more tender crust and possess a crumb with better cell structure. The finer crumb with its thin cell walls gives higher light reflection; hence, the crumb appears to be whiter than the control bread baked without this adjunct. Furthermore, the addition of mono- and diglyceride retards the rate of crumb firming during aging.

One of the earliest and major uses for monoglyceride was, and still is, the addition to shortening. This type of shortening, known as high-ratio shortening, enhances the degree of fat dispersion in cake batters and produces batters of superior mechanical strength which allow the incorporation of higher sugar percentages into cake formulae.

In cake batter, the ratio of shortening to water is not as low as in bread. In cake batters, these proportions are about 1 to 4, whereas in bread, the ratio decreases — 1 part of shortening to 30 parts of water.

TEM, the diacetyl tartaric acid ester of mono- and di-

Table I DISTRIBUTION OF HYDROPHILIC AND LIPOPHILIC GROUPS IN FAT-DERIVED EMULSIFIERS

COMPOUND	STRUCTURAL FORMULA	MOLECULAR WEIGHT	HYDROPHILIC GROUP Wt. %	LIPOPHILIC GROUP Wt. %
Monoglyceride		358.3	20.9	79.1
TEM		574.3	50.7	49.3

*Based on paper presented at the symposium on glycerine uses in food sponsored by the Glycerine Producers' Association, January, 1961

sifier for certain uses*

glycerides has been commercially available since 1948. It was the result of research to develop a glyceride type of emulsifier more suitable for low oil-water ratios such as occur in bread doughs.

The objective of the program which led to TEM was to increase the hydrophilic character of the emulsifier molecule. This was accomplished by esterification of monoglyceride with diacetyl tartaric acid anhydride to form the diacetyl tartaric acid ester of mono- and diglycerides, commonly known as TEM.

As a result of this esterification, the ratio of the hydrophilic (water-loving) to lipophilic (oil-loving) is increased from 1:4 in monoglyceride to 1:1 in TEM as shown in Table I.

In this table, the part of the molecule which is convertible by hydrolysis into free fatty acid is considered as the lipophilic group, whereas the part yielding water-soluble products upon hydrolysis is defined as the hydrophilic group.

Due to this balance, TEM dissolves readily in fat or oil and is equally well dispersible in water.

Interfacial tension is also lowered as shown in Table II. Lower interfacial tension is desirable in an emulsifier for it favors smaller average particle size of the dispersed phase in an emulsion and therefore a more stable emulsion.

Although the distribution of liphophilic and hydrophilic groups in TEM is almost balanced, its hydrophilic character is increased by ionization. (TEM is anionic; monoglyceride is non-ionic; lecithin is electrically neutral — a zwitterion).

The amount of water that can be carried by the dispersed phase in a W/O emulsion is limited as demonstrated in Fig. 3.

On the other hand, when an O/W emulsion is formed with TEM, it can be diluted with water since water is the external or continuous phase. This emulsion is relatively stable since TEM being an anionic surfactant charges the

Table II THE INTERFACIAL TENSION OF WATER AND SOYA OIL

TYPE OF EMULSIFIER	PERCENT ADDED TO SOYA OIL	INTERFACIAL TENSION, dynes per centimeter
Mono- and di-glyceride prepared from soya oil	0	22
	1	10
	4	1.7
TEM, prepared from soya mono- and diglyceride	0	22
	1	2
	4	0.4

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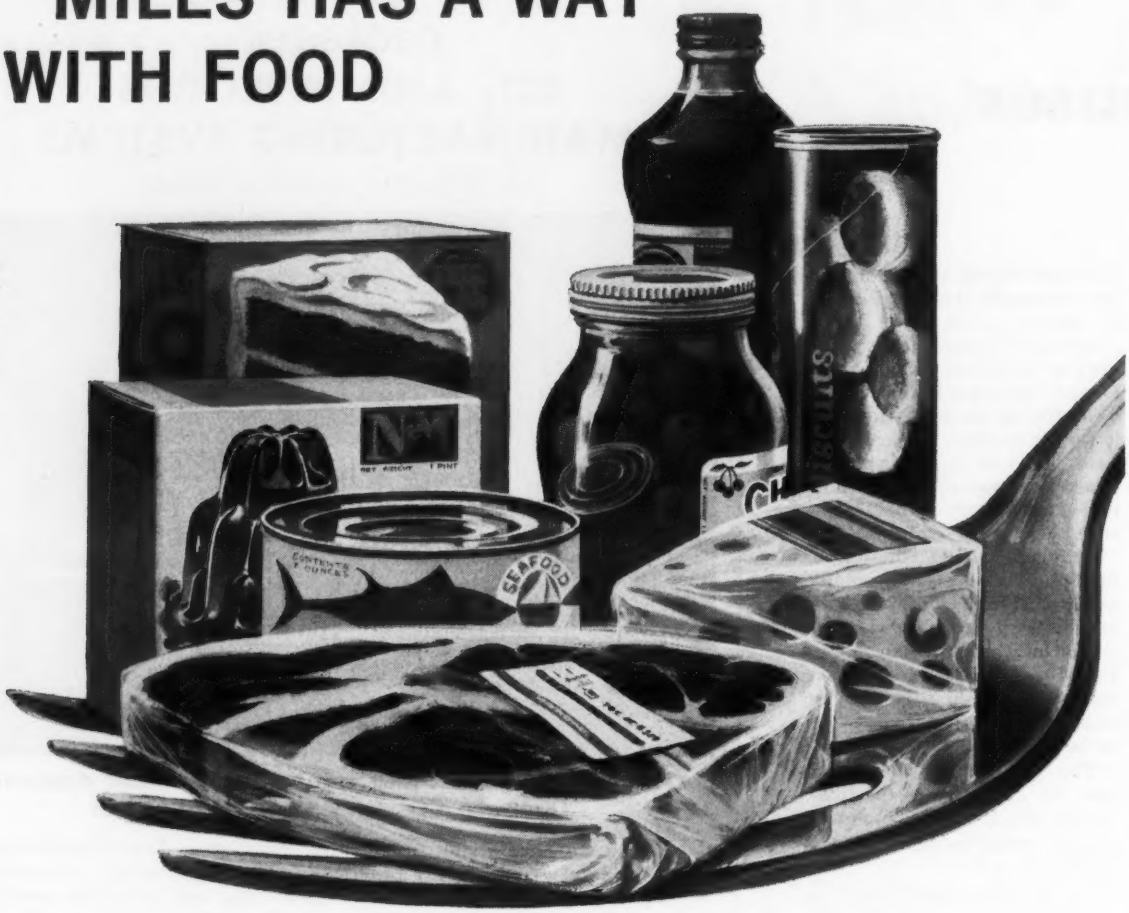

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oil droplets negatively so that they repel each other.

Returning to the 1:30 ratio of shortening and water in bread dough, it can be assumed that these concentration ratios favor the formation of an O/W (oil in water) emulsion.

The proper type of emulsifier for the two general types of emulsions can be selected in advance, according to Bancroft's rule. The same states that an emulsifier with hydrophilic charateristics stabilizes an O/W (oil in water) emulsion and one with lipophilic preponderance stabilizes a W/O (water in oil) emulsion. This rule therefore leads us to conclude that TEM is preferable for dough in which the high water ratio favors water as the continuous phase, which is characteristic of the O/W emulsion.*

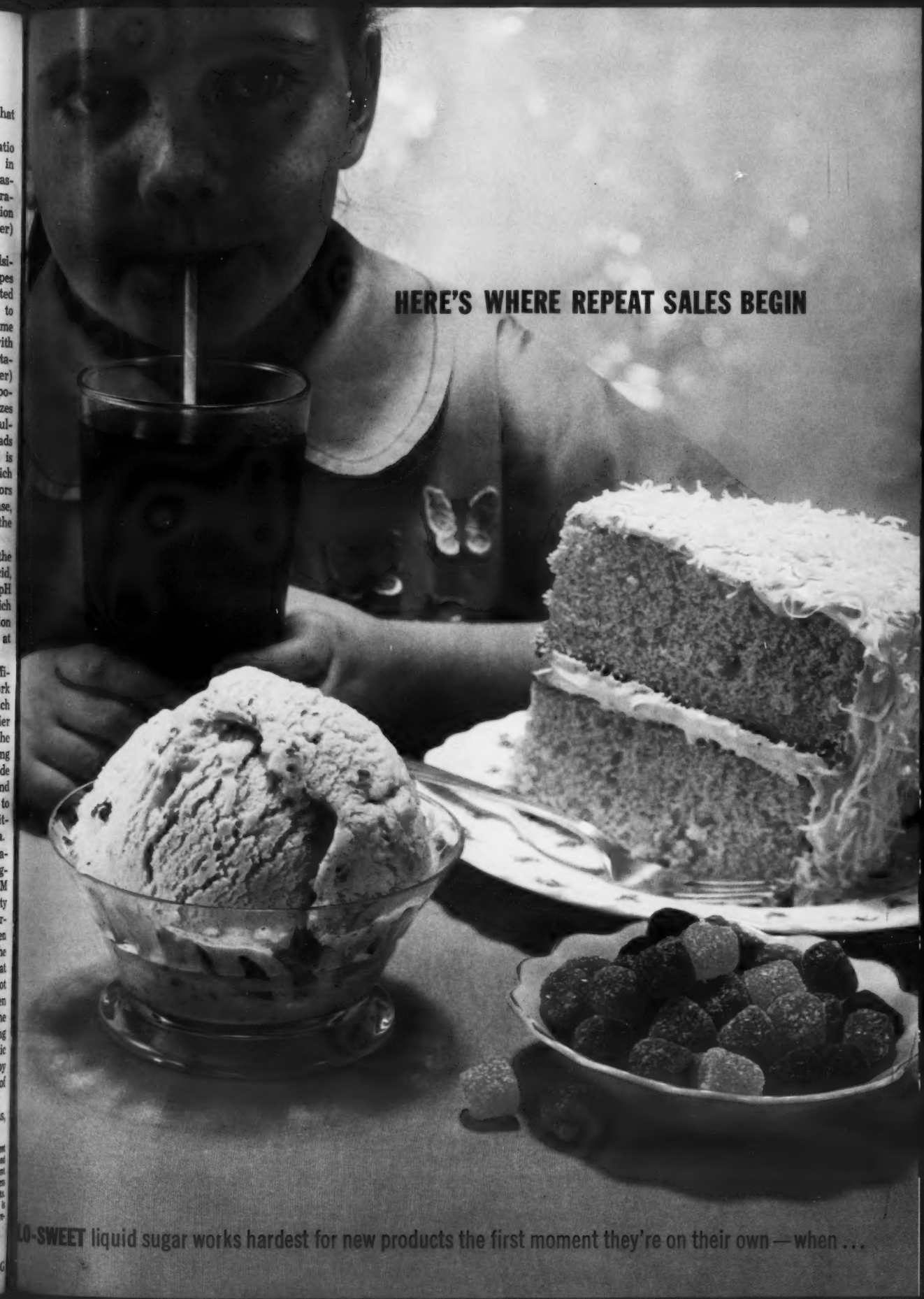
TEM, being acidic, as the half-ester of a dibasic acid, does not interfere with the pH of the fermenting dough which has its optimum fermentation and best enzymatic activity at a pH of 5.

Furthermore, TEM is sufficiently hydrophilic to work well in dough water, which tends to make an emulsifier less hydrophilic due to the salting-out effect of strong electrolytes (sodium chloride and ammonium-, calcium- and potassium salts in addition to the minerals in the water itself) present in the formula.

In baking, the thermal stability of an emulsion is of significance. Emulsions with TEM are heat-stable. The stability derives from the ionic properties of TEM which strengthen its union with water. The kinetic energy of motion at elevated temperatures does not break the association between the water and TEM, while the reciprocal hydrogen bonding between water and non-ionic emulsifiers is easily broken by heat, even in the absence of other factors.

From these considerations,

*Editor's Note: In this article the inherent implication—the best emulsifier for bread dough will be ipso facto the best surfactant for retarding firming associated with staleness—is not accepted by many cereal chemists. Other views on the staling process, which is a rather complex phenomenon, will be presented in future articles.



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it may be deduced that the inclusion of TEM into a white bread formula would improve the score of bread. This assumption has been verified as shown by comparative tests of breads made with and without TEM — See Fig. 2.

Other uses: TEM is not only the baker's helpmate, but it found also widespread acceptance in other areas of food processing, as illustrated by the following examples.

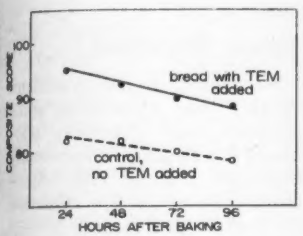

Fig. 2. **Score with age of white bread**

TEM in its concentrated form is used in the manufacture of confectioner's coatings which are formulated with cocoa powder and vegetable fat. In this application, TEM controls the viscosity in the enrobing operation whether lecithin is used or not.

In addition, TEM improves the gloss and retains this sought-after gloss on candy pieces and baked goods. It also improves the taste of these coatings by removing the waxy mouth feel.

Another field for which TEM is admirably suited is cream fillings which are high volume, low density, aerated emulsion foams.

Another product line in which TEM can be found is packaged salad dressings. These dressings are prepared at the table. There the presence of TEM extends the table life of the dressing because instantaneous separation of dressing into distinct layers is eliminated. Furthermore the taste improves. The herbs in the dressing yield more easily their flavor because TEM sol-

For more information on product at left, circle 6538 . . . see information request blank opposite last page.

TO MANAGEMENT EXECUTIVES CONCERNED WITH SALES... *If you could probe the mind of the average housewife as she chooses her food purchases from the grocer's shelves, you'd find her mentally weighing such considerations as cost, nutritional value, ease of preparation, and flavor. Though mentioned last, flavor's impact is actually greatest because it is the gauge by which other members of the family judge her mealtime fare. Thus, flavor is bound to be a critical factor in her evaluation of your food, dessert or beverage product. As an executive concerned with sales, flavor, too, is obviously your concern. And this brings us to FRITZSCHE . . . a first name in flavors since 1871. By letting our specialists work with your product development and manufacturing divisions on the production of flavorings tailor-made to your needs, you will be assured of products that taste better and sell better. Remember: Your product is ONLY as good as its FLAVOR! Let FRITZSCHE experience guarantee you an appropriate and superior flavor.*

FRITZSCHE BROTHERS, Inc.

A FIRST NAME IN FLAVORS SINCE 1871

76 NINTH AVENUE NEW YORK 11, N. Y.

Branch Offices and *Stocks: Atlanta, Ga., Boston, Mass., *Chicago, Ill., Cincinnati, Ohio, Greensboro, N. C., *Los Angeles, Cal., Philadelphia, Pa., San Francisco, Cal., St. Louis, Mo., Montreal and *Toronto, Canada; *Mexico, D. F. and *Buenos Aires, Argentina. **Plants:** Clifton, N. J. and Buenos Aires, Argentina.

6539 on Reader Service Slip.

ubilizes their oil-soluble flavor elements.

In the manufacture of spice extracts and spice oils, use of the solvent power of TEM is made. Here TEM performs a double function as solubilizer and emulsifier.

The high solvent power of TEM leads to another interesting application, the conversion of oil-soluble food colors into water-soluble dyes. END

Report on the

Spice Situation

According to the American Spice Trade Association spice supplies were generally adequate for America's increasing demands during 1960. Spice traders however are reluctant to predict the future.

They point out that much depends on political developments in Indonesia and other parts of the Far East. Unsettled conditions and government controls of exports in those areas have hampered trade in such important commodities as pepper, cinnamon and nutmegs this past year.

Recently, the political disturbance in South Vietnam has adversely affected the outlook for our top grade of cinnamon. Fortunately, our spice commerce with India has improved each year, brightening the overall picture.

India is an alternate supplier of pepper and a large source of ginger, turmeric and various spice seeds. Credit for the improved outlook goes in part to the Indian Government's active interest in exports.

Pepper prices on the U.S. market took a sharp upswing in late 1959 as the result of reduced stocks in Singapore and reported speculative buying in that market. The high point was reached in January 1960, but since has declined.

An unofficial estimate indicates that the U.S. imported over 40 million pounds of pepper in 1960, compared with about 37.5 million in 1959. Complete, official tabulations of the Department of Commerce are not yet available. World supplies will probably

STARCHES and SYRUPS

Keep your product in her cart ...week after week

Corn starches and syrups are time-tested, nourishing, economical carbohydrates. They've long been used and accepted as foods and food ingredients. They may be the answer to problems you have resulting from recent legislation regarding foods because:

In addition to being time-tested, nourishing, economical carbohydrates, corn starches and syrups can provide valuable functional properties as:

• Stabilizers • Emulsifiers • Binders • Humectants • Bland sweeteners • Texturizers • Preservatives (of natural body and color) • Thickeners (for consistency control) • Sugar Crystalization control • Coatings—Glazes

CORN STARCH is ideal for baking, baking powder, meats, mustard, salad dressing, custards, pudding, canned soups, etc.

CORN SYRUPS are used in mixed syrups, infant foods, preserves, jams, jellies, baked beans, sausage and cured meats, frozen and canned fruits, frozen deserts and many other products.

CORN SYRUP SOLIDS are widely used in ice cream, baked goods, frozen fruits, dry food mixes, jams, jellies, table ready and canned meats, to mention just a few.

Whatever you may be processing OK BRAND corn syrups or starches will help you keep your product in her cart week after week.

Call the Man from Hubinger ...his service is freely available. Write, wire or phone today.

THE HUBINGER COMPANY
Keokuk, Iowa

NEW YORK • CHICAGO • LOS ANGELES • BOSTON • CHARLOTTE • PHILADELPHIA

You can depend on HUBINGER *... fast shipment by rail ... prompt delivery by truck*

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be slightly greater in 1961, but there is no telling how much of the important Indonesian crop will be put on the world market.

Nutmeg's general price level has declined this past year as the West Indies has returned to the market in greater volume. Much of that area's production was destroyed by a hurricane in 1955. Since it normally supplies about half of the world crop, prices have been at a higher level while new trees were being brought into a bearing stage.

The U.S. is currently importing about 80% of its spice consumption. In 1959, for example, this amounted to 149,381,000 pounds. Another 38 million pounds were produced in this country, consisting mainly of mustard seed, chili peppers and paprika. During that year this country exported about four million pounds of spices.

6541 on Reader Service Slip.

Two enzymes improve feed qualities

Uses-Features: Two new and commercially available enzymes are used to improve the digestibility of grain ingredients in animal feeds.

One of these, Rhozyme F-1A is added to Western barley and results in feeding value for chicks and poultry that equals the feed value of corn.

The other, Rhozyme F-3C is used as a supplement in low-moisture corn rations to increase daily average cattle gains.

Description: The use of enzyme feed supplements is permitted in combination with other new drugs which have been given prior approval by the FDA. Feed manufacturers are not required to file supplementary applications with the FDA.

Both of the enzymes are easily incorporated into feed formulations with ordinary mixing procedures and are stable in normal storage.

Supplier: Rhom & Haas Co., Washington Square, Philadelphia 7, Pa.

6542 on Reader Service Slip.

BAKING BREAKTHROUGH *Fluid Flex Style*

How Durkee Research is Revolutionizing Baking with a Fluid Shortening

THE PROBLEM: *Develop a superior emulsified shortening to meet the needs of today's wholesale bakeries.* As more and more large scale bakeries turn to automated production facilities, ingredient suppliers must adapt or develop products expressly for the bulk handling systems such facilities require. Durkee, long a supplier of emulsified shortenings to the bakery industry, turned to its Technical Service Staff to meet this challenge.

THE SOLUTION: *Liquefy, Emulsify, Infuse:* Producing emulsifiers for over 20 years, Durkee knew what potential baking improvements lay waiting the development of a workable combination of emulsifiers and oil in one pourable, pumpable fluid product . . . a product built for automated bulk handling systems. Using developmental and production procedures learned through those years of experience, Durkee perfected a method of infusing microscopic crystals of a unique emulsifier into a top quality liquid oil that produces lighter, finer textured baked goods with longer shelf life. We named this new shortening FLUID FLEX.

THE SIGNIFICANCE: *Revolutionary.* Here again, Durkee's technical competence in the fields of fats and oils led to an entirely new concept of production for an entire industry *before* the industry knew it could be done. Purposeful research is continually in progress at Durkee. Here is where we may be able to help you most whenever your product or process warrants further attention. We'd be glad to help. Just phone or write.

DURKEE TECHNICAL SERVICE

Glidden

Department FP • 900 Union Commerce Building • Cleveland 14, Ohio
Jamaica, N. Y. • Louisville, Ky. • Berkeley, Calif. • Chicago, Ill.

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NEW MIXER

Get set to topple some traditions in fluid-mixing ease and economy

You won't have to lubricate it for five years.

You can't overload the gear drive.

It comes with a chemical plant motor as *standard*, at no extra cost.

You don't need three hands to remove the shaft.

And it mixes fluids like no portable mixer you've ever seen. Delivers up to 45% more fluid flow in gear-drive models. Higher impeller head in direct-drive models. Actually lets you handle many mixing jobs with a *smaller* mixer drawing *less power*.

That's just a sampling of the new LIGHTNIN Portable Mixer. It's ready —in sizes from ⅛ to 3 hp. And the price is right.

Your LIGHTNIN Mixer representative will be glad to show you why you can use it to mix fluids better—and at lower cost—than ever before. You'll find him listed in Thomas' Register of American Manufacturers and in the yellow pages of your telephone directory. Call him today. Or write us for descriptive Bulletin B-520.

SHOCK OVERLOADS can't damage the mixer drive. In gear-drive models, GripSpring assembly between gear and drive shaft lets gear slip if overloaded more than 50%. It's a safety feature you never could get before in a portable mixer.

IN FIXED MOUNTINGS, TOO. Get the same all-new advantages in permanent-mounting LIGHTNIN Mixers for open and closed tanks. A complete line, sized from ¼ to 3 hp. For details on these, send for Bulletin B-521.

Lightnin® Mixers

MIXCO fluid mixing specialists

MIXING EQUIPMENT Co., Inc., 132-d Mt. Read Blvd., Rochester 3, N.Y.

In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 19, Ont.

In Europe: Lightnin Mixers, Ltd., Poynton, Cheshire, England

6544 on Reader Service Slip.

Banana Crystals, a free-flowing powder, is available in 1-lb cans or 100-lb drums

Fresh flavor banana crystals

- **for prepared mixes**
- **for bakery and dairy products**

FP STAFF

THE SAME continuous, high-vacuum process which has been producing Orange Crystals — see photo-caption story on facing page — is now also producing Banana Crystals.

This newest addition to the line of Crystal products in commercial production is a light colored, dry, free-flowing powder.

The dry product is 50% banana solids and 50% corn syrup solids (malto-dextrose), no other additives (moisture less than 0.8%). Upon the addition of the proper amount of water it reconstitutes to 80% banana and 20% corn syrup solids, for fresh bananas are approximately 25% banana solids and 75% water.

The reconstituted product has a distinctly fresh banana flavor. For interesting flavor variations, milk or other liquids can be used in place of water when reconstituting.

It is now being used in prepared dessert mixes and also a prepared nut-bread mix. Among the many possible applications of Banana Crystals are icings, cakes, dairy-base beverages.

Banana Crystals are produced by Orange Crystals Division, Plant Industries, Inc., a controlled subsidiary of Salada-Shirriff-Horsey Ltd., the Canadian packaged food company. Their plant is the world's first and only plant for the production of citrus juice crystals.

The original company known as Orange Crystals, Inc., was established in 1953; the huge dryer — see facing page — was installed in 1954 and went into commercial operation in 1955. In 1956, the control of the company was acquired by a group headed by Mr. Horsey, who is now the president of Plant Industries and also Salada-Shirriff-Horsey, Ltd.

Other products in commercial production by Orange Crystals Division are: Orange Crystals, Grapefruit Crystals, Blended Orange and Grapefruit Crystals. In addition, based on experimental test runs the following products can be produced to order in dry crystalline form: pineapple, lime, lemon. For samples and additional information on these products write Orange Crystals Division, Plant Industries, Plant City, Fla.

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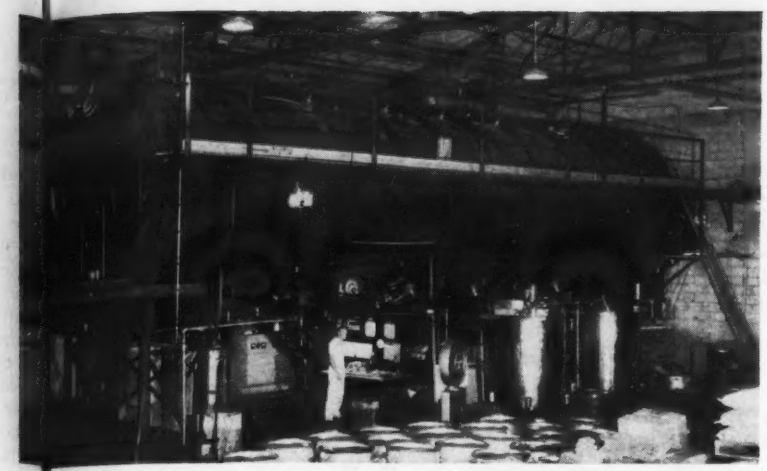

FIG. 1

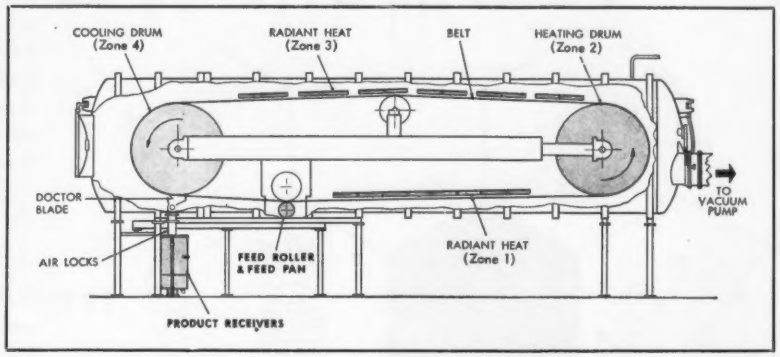

FIG. 2

CONTINUOUS VACUUM DEHYDRATION at Orange Crystals Division for the production of Banana Crystals and other dehydrated juice products (see facing page) is carried out in the huge cylinder (12 ft dia x 60 ft) shown in the photo above. At right is a schematic cross-sectional drawing of this dehydrator. Drying is conducted at an absolute pressure of about 1 to 3 mm Hg; the high vacuum is obtained with a 5-stage steam ejector system.

Introduction of material to be dried into this high vacuum system as well as the initial evaporation or "boiling" which takes place in the first heating zone causes an extremely porous structure to be developed. This distinguishing feature of the drying process, which is often designated as puff drying, results in dehydrated products which are easily reconstituted.

The drying takes place on a stainless-steel belt, 4 ft wide with a total length of about 95 ft. In operation, the belt is coated with a viscous, (usually heavily concentrated) liquid or slurry by the feed roll. Once applied, the material to be dried passes through a carefully controlled heating and cooling profile. In Zone 1, radiant heat to the underside of belt causes a slight evaporation resulting in a porous structure which in turn makes rapid drying possible in Zone 2 as the belt passes around the heated drum. In Zone 3 radiant heat direct to the nearly dried product reduces the moisture to 2-3%. (Lower moistures when required are obtained by use of desiccants either in the final package or in bulk storage.) At this point the warm product is in a taffy-like or gummy condition; hence it is cooled in Zone 4 as it passes around the second drum and it is easily flaked off the belt by a doctor blade. The entire cycle takes only 15 to 120 seconds depending on material being processed and thickness of layer applied at feed roll.

A typical heating and cooling profile for the processing of Instant Tea is shown in Fig 3, the heating zones corresponding to those designated in Fig 2. Fig 4 shows three of the instant teas being produced in this type of equipment. One of the advantages of dehydrated products produced by this method is the greater rapidity which they dissolve in cold water as contrasted to spray-dried products.

World rights to manufacture and market this type of continuous vacuum dehydrating equipment have been acquired by Girdler Process Equipment Division of Chemetron Corporation, Louisville 1, Ky. Weld Conley, who directed the development of the process and its application on a test basis to many products at the Vacuum Dehydrator Section, Chain Belt Company, Milwaukee, has moved to the Girdler Process Equipment Division as Technical Director of continuous process drying operations.

6546 on Reader Service Slip.

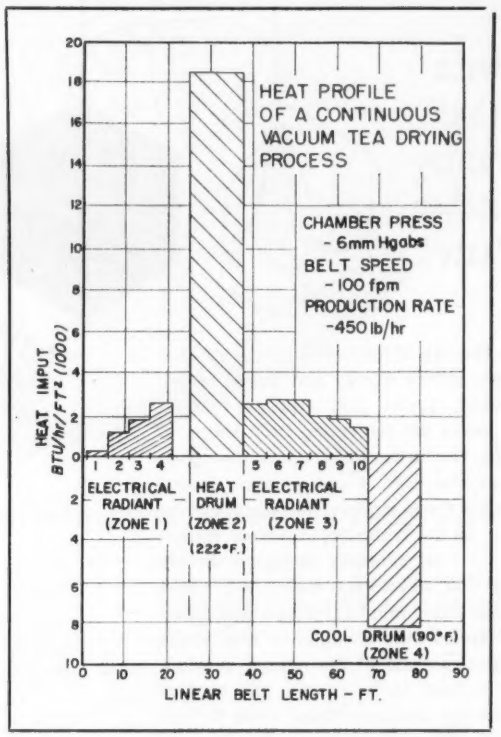
HEAT PROFILE OF A CONTINUOUS VACUUM TEA DRYING PROCESS
CHAMBER PRESS - 6mm Hgabs
BELT SPEED - 100 fpm
PRODUCTION RATE - 450 lb/hr
HEAT IMPUT BTU/hr/FT² (1000)
ELECTRICAL RADIANT (ZONE 1)
HEAT DRUM (ZONE 2) (222°F.)
ELECTRICAL RADIANT (ZONE 3)
COOL DRUM (90°F.) (ZONE 4)
LINEAR BELT LENGTH - FT.

FIG. 3

FIG. 4

SPACE AGE FLAVORS...

...with that Country Kitchen Taste!

This is the day of jet-flight and dehydrated potatoes; atomic energy and frozen bread; super-sonic speed and "quicker-than-instant" mixes for everything from soups to desserts. This is the threshold of the space age and the era of convenience foods. Flavors for these modern foods must be as dynamic as the technology of their formulation . . . as carefully designed as the science that developed them. Yet, these space-age foods must still retain that home cooked taste. Only a company that keeps thoroughly abreast of the newest developments in food can give you this kind of "built for the product" flavor. Fries & Fries provides you with space-age flavors with that country kitchen taste! Let our laboratories show you what dynamic flavor research means.

MANUFACTURING CHEMISTS
FRIES & FRIES
INC.
CINCINNATI
U.S.A.

Cincinnati 110 E. 70th St. New York 418 E. 91st St.

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Generally Recognized As Safe

304 Anticaking agents (7), chemical preservatives (32), emulsifying agents (9), nonnutritive sweeteners (8), nutrients and/or dietary supplements (81), sequesterants (29), stabilizers (12), and miscellaneous or general purpose (80), trace minerals for animal feeds (46) — see FDA list below

197 Naturally derived seasonings and flavors — FDA list in FOOD PROCESSING, March, 1960 or Federal Register, January 19, 1961

258* Flavoring substances — Industry list in FOOD PROCESSING, March, 1961

FP STAFF

WHICH SUBSTANCES in use prior to Jan. 1, 1958, are Generally Recognized As Safe under conditions of intended use among experts qualified by scientific training and experience to evaluate "its" safety either by scientific procedures or by experience based on common use and therefore not subject to provisions of the Additives Law?

Some substances like sodium chloride (ordinary table salt) and sodium bicarbonate (ordinary baking soda) are so obviously GRAS that even FDA said it did not intend to compile them in any listing. *FDA listings,* prepared as a service to the industry, are, as indicated in the heading, a compilation of some 197 naturally derived flavorings and some 258 other substances added directly to foods as ingredients to accomplish a useful purpose. This latter list went through several revisions and additions. Latest action was in the *Federal Register* of Jan. 31, 1961, as described in last issue of FOOD PROCESSING, and is published in full below.

GRAS lists by industry are expected to appear from time to time. The first of these was published in FOOD PROCESSING last month and included some 257 flavoring substances considered as GRAS by the expert panel of the Flavoring Extract Manufacturers' Assn.

What is the status of these GRAS lists by industry insofar as FDA is concerned? That is, suppose in FDA's opinion, an item in such a list is not generally recognized as safe.

As pointed out in last month's issue, the Additives Law confers no special authority on the FDA for deciding that an ingredient is GRAS. Hence, to implement its adverse opinion, FDA would have to make a seizure, then prove in court beyond a reasonable doubt that the substance in question was not generally recognized as safe.

Will food manufacturers accept industry GRAS lists at their face value or will they insist on official FDA approval which apparently now may only be had by filing petitions?

If industry — both the manufacturer of the substances and the food processor who uses the substances — maintains a united front, we feel that any differences between FDA and industry will probably be worked out on an informal basis.

We would urge food processors to accept industry GRAS lists which are prepared objectively by scientists as was the Flavor GRAS list promulgated by the Expert Panel of the Flavoring Extract Manufacturers' Association and published in FOOD PROCESSING last month.

*Yucca mohavensis, extract was inadvertently omitted from the list reported to us and published last month.

Anticaking agents

Aluminum calcium silicate, 2 per cent, in table salt.
Calcium silicate, 5 per cent, in baking powder.
Calcium silicate, 2 per cent, in table salt.
Magnesium silicate, 2 per cent, in table salt.
*Sodium aluminosilicate (sodium silicoaluminate) 2 per cent.
*Sodium calcium aluminosilicate, hydrated (sodium calcium silicoaluminate) 2 per cent
Tricalcium silicate, 2 per cent, in table salt

Chemical preservatives

Ascorbic acid
Ascorbyl palmitate
Benzoic acid, 0.1 per cent
Butylated hydroxyanisole, total content of antioxidants not over 0.02 per cent of fat or oil content, including essential (volatile) oil content of food.
Butylated hydroxytoluene, total content of antioxidants not over 0.02 per cent of fat or oil content, including essential (volatile) oil content of food.
Calcium ascorbate
Calcium propionate
*Calcium sorbate
Caprylic acid, in cheese wraps.
Dilauryl thiodipropionate, total content of antioxidants not over 0.02 per cent of fat or oil content, including essential (volatile) oil content of the food.
Erythorbic acid
Gum guaiac, 0.1 per cent (equivalent antioxidant activity 0.01 per cent) in edible fats or oils.
*Methylparaben (methyl-p-hydroxybenzoate) 0.1 per cent
Nordihydroguaiaretic acid, total content of antioxidants not over 0.02 per cent of fat or oil content including essential (volatile) oil content of the food.
Potassium bisulfite, not in meats or in food recognized as vitamin B_1 source.
Potassium metabisulfite, not in meats or food recognized as vitamin B_1 source.
Potassium sorbate

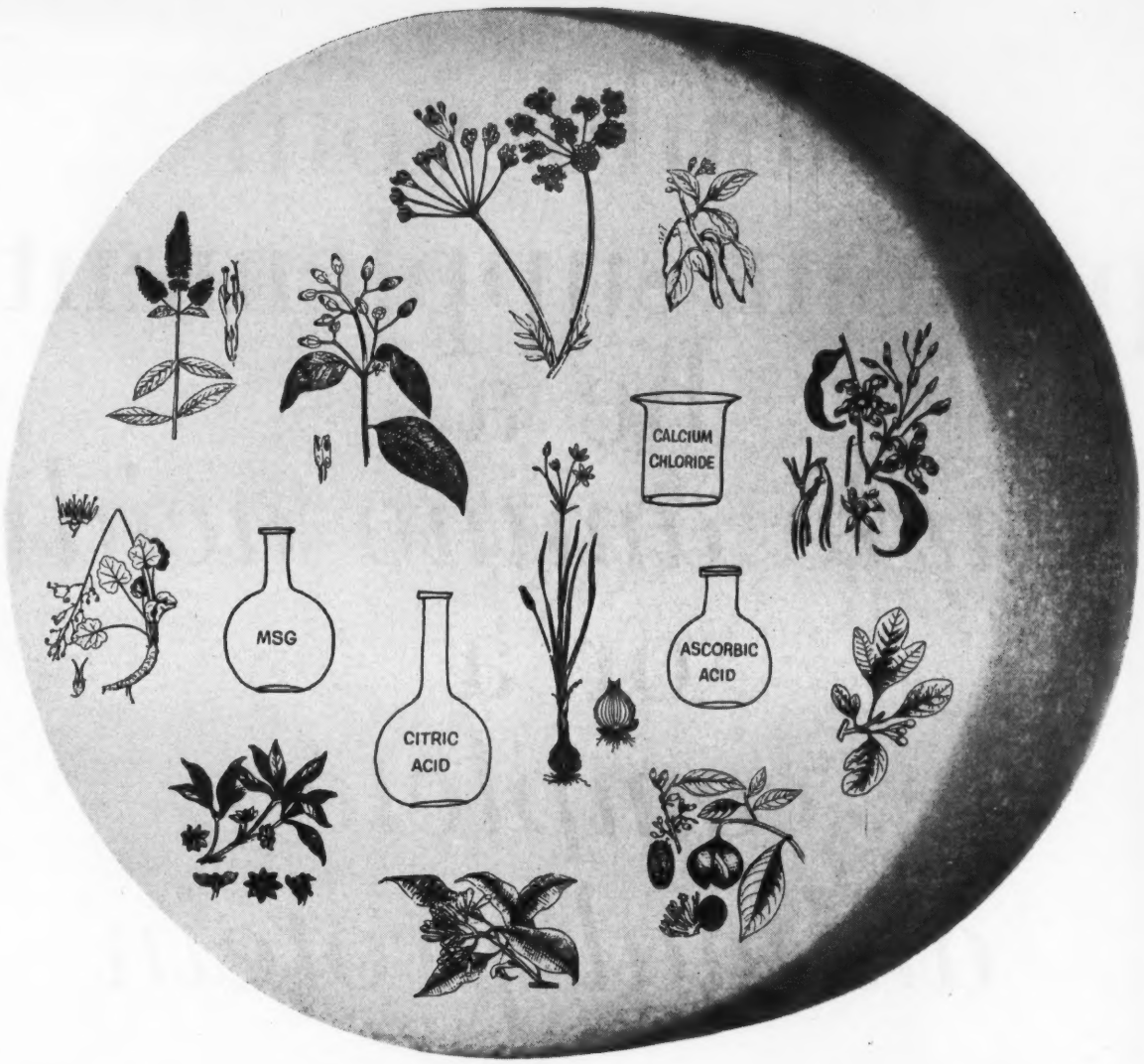
Undue influence of non-scientists!

Last month we blamed the undue influence that non-scientists have had on the administration of the Additives Law for all its shortcomings. This statement appeared in an editorial commenting on the action taken by the industry group which named 257 flavors as GRAS.

Both scientists and non-scientists who have worked closely with FDA in the administration of the law take issue with this statement, and we agree it so oversimplifies the issues involved that it is in error.

What we should have said was that many difficulties encountered in the administration of the Additives Law are traceable to the interpretations placed on it by non-scientists . . . and, as we did state last month, the lack of proper exercise of scientific judgment in the administration of the Additives Law created numerous unexpected difficulties for industry.

HOWARD P. MILLEVILLE
Editor



IF THEY CAN BE PRESSED INTO A TABLET...MORTON WILL COMBINE THEM FOR YOU!

Morton will work with either seasoning suppliers or canners to custom-produce the right flavoring tablets for every job!

As part of its complete service to canners, packers and processors, Morton Salt Company will make tablets containing the exact combination of salt and other flavoring agents desired, following the user's specifications.

In fact, Morton has, on occasion, produced tablets that do not even contain salt!

Morton combination tablets are precision made to your exact requirements. Ingredients may include any flavoring agents which can be combined into a tablet, in any size from 10-grain to 400-grain.

Morton's Complete Dispensing Service—Morton also offers a complete line of tested and approved dispensers, including Salt Tablet Depositors which deposit up to 700 tablets an hour with guaranteed accuracy. They will help you reduce costs, eliminate waste and assure better flavor control. All equipment is installed and serviced by Scientific Dispensing Company Division of Morton Salt Company.

How many things go into your product that should be combined in tablet form?

I would be interested in the possibilities of combining _____ *in tablet form.*

Name_____
Title_____
Company_____
Address_____
City_____ State_____

MORTON SALT COMPANY
INDUSTRIAL DIVISION
Dept. FP 4,
110 North Wacker Drive, Chicago 6, Ill.

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Propionic acid
Propyl gallate, total content of antioxidants not over 0.02 per cent of fat or oil content, including essential (volatile) oil content of the food.
*Propylparaben (propyl p-hydroxybenzoate), 0.1 per cent
Sodium ascorbate
Sodium benzoate, 0.1 per cent
Sodium bisulfite, not in meats or in foods recognized as a source of vitamin B^1.
Sodium metabisulfite, not in meats or in foods recognized as a source of vitamin B_1.
Sodium propionate
Sodium sorbate
Sodium sulfite, not in meats or in foods recognized as a source of vitamin B_1.
Sorbic acid
*Stannous chloride, 0.0015 per cent calculated as tin Sulfur dioxide, not in meats or in foods recognized as a source of vitamin B_1.
Thiodipropionic acid, total content of antioxidants not over 0.02 per cent of fat or oil content, including essential (volatile) oil content of the food.
Tocopherols

Emulsifying agents

Cholic acid, 0.1 per cent, dried egg whites
Desoxycholic acid, 0.1 per cent, dried egg whites
Diacetyl tartaric acid esters of mono- and diglycerides from the glycerolysis of edible fats or oils.
Glycocholic acid, 0.1 per cent, dried egg whites
Mono- and diglycerides from the glycerolysis of edible fats and oils
Monosodium phosphate derivatives of mono- and diglycerides from the glycerolysis of edible fats or oils
Ox bile extract, 0.1 per cent, dried egg whites.
Propylene glycol
Taurocholic acid (or its sodium salt) 0.1 per cent, dried egg whites.

Nonnutritive sweeteners

*Ammonium saccharin
Calcium cyclamate (calcium cyclohexyl sulfamate)
Calcium saccharin
*Magnesium cyclamate (magnesium cyclohexyl sulfamate)
*Potassium cyclamate (potassium cyclohexyl sulfamate)
Saccharin
Sodium cyclamate (sodium cyclohexyl sulfamate)
Sodium saccharin

Nutrients and/or dietary supplements[1]

*Alanine (L- and DL-forms)
*Arginine (L- and DL-forms)
Ascorbic acid
*Aspartic acid (L- and DL-forms)
*Biotin
Calcium carbonate
*Calcium citrate
*Calcium glycerophosphate
Calcium oxide
Calcium pantothenate
Calcium phosphate (mono-, di-, tribasic)
*Calcium pyrophosphate
Calcium sulfate
Carotene
*Choline bitartrate
*Choline chloride
Copper gluconate, 0.005 per cent
Cuprous iodide, 0.01 per cent, in table salt, as a source of dietary iodine

Should your protein supplement be a *single amino acid* or a *complete animal protein*?

To be sure of effective protein balance in your food products, you need *complete animal protein* . . . the kind you get in high-quality SHEFTENE protein supplements.

Adding SHEFTENE milk protein boosts not only the level of lysine, but of the other essential amino acids as well . . . does it as effectively as individual amino acid supplementation . . . and does it *naturally*, without imparting undesirable taste, color or odor. Furthermore, most SHEFTENES also offer functional advantages as ingredients.

The job of improving protein quality is one in which our facilities at the National Dairy Research and Development Division are steadily employed.

For a complete list of Sheffield protein supplements, and for technical information on any product application, write Dept. FP-41:

SHEFFIELD CHEMICAL
Norwich, N. Y.
A DIVISION OF NATIONAL DAIRY PRODUCTS CORPORATION

Western U.S. distribution through

VAN WATERS & ROGERS, INC. — Seattle, Spokane, Portland, Houston, Dallas
BRAUN-KNECHT-HEIMANN CO. — San Francisco, Salt Lake City, Denver
BRAUN CHEMICAL COMPANY — Los Angeles, San Diego, Phoenix, Albuquerque, El Paso

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For more information on product at right, specify 6550 . . . see information request blank opposite last page.

The Fruits of Knowledge in Flavor

ctical, cost-saving techniques in natural and artificial flavor velopment originate in the Kohnstamm laboratories. More than a tury of experience can shed invaluable light on your present-day ds. Our book of flavor knowledge is open to you. Write today.

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First producers of certified colors

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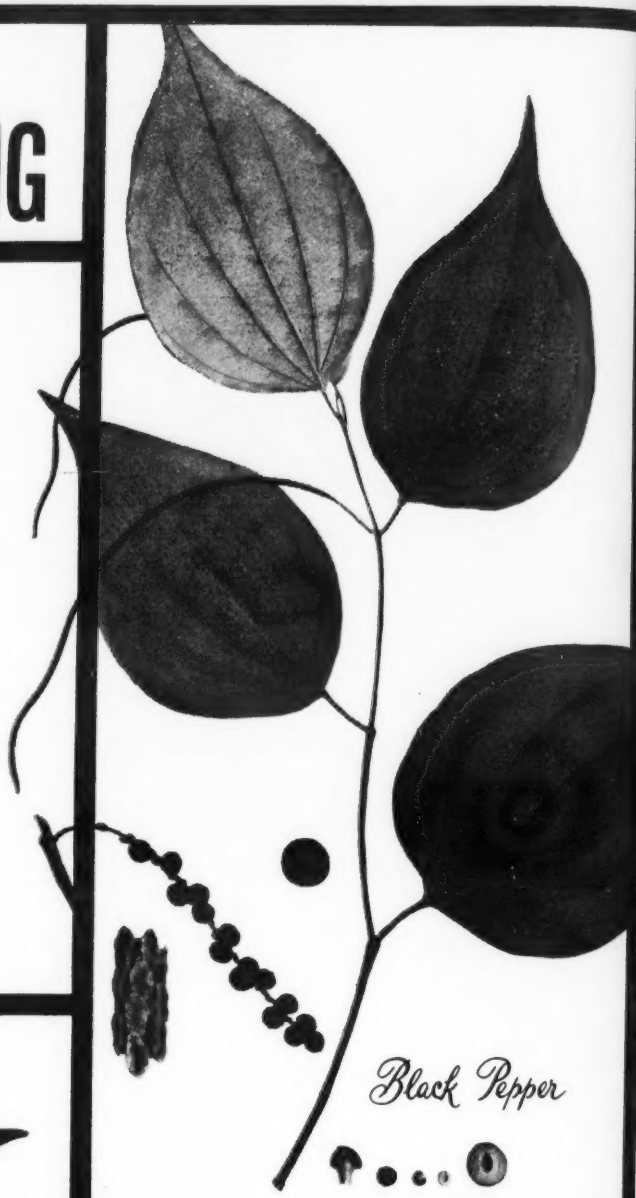
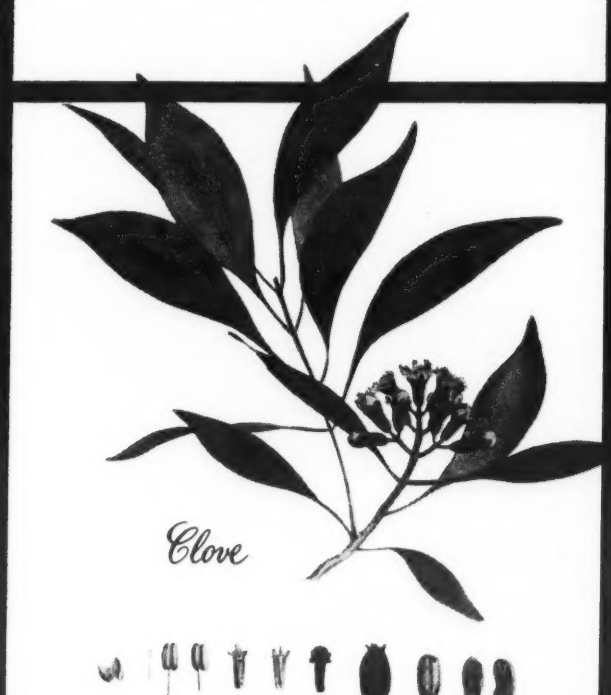
FREEZE DRYING

D&O offers SPISOSEAL the latest development in seasonings for foods of the future. SPISOSEALS are extractions of natural spices, spray dried for absolute flavor stability and unsurpassable shelf life. Full, instant release of flavor, aroma and strength . . . highly recommended for freeze dried foods. Write the D&O Dry Materials Division, 249 Goffle Road, Hawthorne, N. J., for detailed information.

Write for copy of Spisoseal booklet





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MANHATTAN INDUSTRIAL CENTER
SEVENTY-FIVE 9TH AVE. NEW YORK 11, N. Y.
SALES OFFICES IN PRINCIPAL CITIES OUR 162ND YEAR OF SERVICE

D&O ESTABLISHED 1798

FLAVOR BASES
ESSENTIAL OILS
AROMATIC CHEMICALS
DRY FLAVORINGS
AND SEASONINGS

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*Cysteine (L-form)
*Cystine (L- and DL-forms)
Ferric phosphate
Ferric pyrophosphate
Ferric sodium pyrophosphate
*Ferrous gluconate
*Ferrous lactate
Ferrous sulfate
*Glycine (aminoacetic acid), in animal feeds
*Histidine (L- and DL- forms)
*Inositol
Iron, reduced
*Isoleucine (L- and DL-forms)
*Leucine (L- and DL-forms)
*Linoleic acid (prepared from edible fats and oils and free from chickedema factor)
Lysine (L- and DL-forms)
*Magnesium oxide
*Magnesium phosphate (di-, tribasic)
*Magnesium sulfate
*Manganese chloride
*Manganese citrate
*Manganese gluconate
*Manganese glycerophosphate
*Manganese hypophosphite
*Manganese sulfate
*Manganous oxide
*Mannitol, 5 per cent, in special dietary foods
*Methionine, animal feeds.
*Methionine hydroxy analog and its calcium salts, animal feeds.
Niacin
Niacinamide
D-Pantothenyl alcohol
*Phenylalanine (L- and DL-forms)
Potassium chloride
*Potassium glycerophosphate
Potassium iodide, 0.01 per cent, in table salt as a source of dietary iodine.
*Proline (L- and DL-forms)
Pyridoxine hydrochloride
Riboflavin
Riboflavin-5-phosphate
*Serine (L- and DL-forms)
Sodium pentothenate
Sodium phosphate (mono-, di-, tribasic)
Sorbitol, 7 per cent, in foods for special dietary use.
Thiamine hydrochloride
Thiamine mononitrate
*Threonine (L- and DL-forms)
Tocopherols
a-Tocopherol acetate
*Trypotophane (L- and DL-forms)
*Tyrosine (L- and DL-forms)
*Valine (L- and DL-forms)
Vitamin A
Vitamin A acetate
Vitamin A palmitate
Vitamin B_{12}
Vitamin D_2
Vitamin D_3
*Zinc sulfate
*Zinc gluconate
*Zinc chloride
*Zinc oxide
*Zinc stearate (prepared from stearic acid free from chickedema factor)

Sequestrants[2]

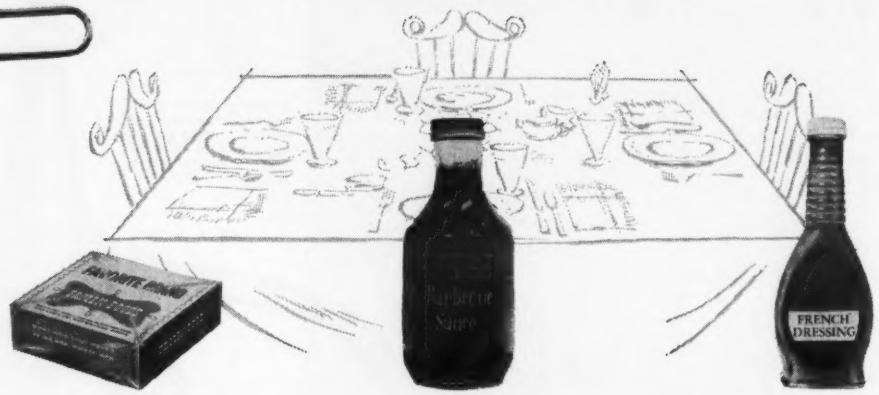
Calcium acetate
Calcium chloride
Calcium citrate
Calcium diacetate
Calcium gluconate
Calcium hexametaphosphate
Calcium phosphate, monobasic
Calcium phytate
Citric acid
Dipotassium phosphate
Disodium phosphate
Isopropyl citrate, 0.02 per cent
Monoisopropyl citrate
Potassium citrate
Sodium acid phosphate
Sodium citrate
Sodium diacetate
Sodium gluconate
Sodium hexametaphosphate
Sodium metaphosphate
Sodium phosphate (mono-, di-, tribasic)
Sodium potassium tartrate
Sodium pyrophosphate
Sodium pyrophosphate, tetra
Sodium tartrate

KELCO COMPANY

REFINED ALGIN PRODUCTS

technical bulletin

Use unique Kelco Algin Colloids to improve your food products



In Frozen Foods, Kelcoloid, in acid to neutral foods having oil-water systems, provides emulsion stability. Coarse ice crystal formation is retarded. Kelcoloid holds structure of food, maintains smooth uniform texture, and promotes complete flavor release.

In Gravies, and in Cream, Meat and Barbecue Sauces, Kelcoloid provides efficient emulsion stability, and aids in thickening and bodying, too. Kelcoloid produces properly stabilized, free-flowing sauces that are homogenous and eye appealing, with clean full flavor. Shelf life is measurably extended.

In Salad Dressings, Kelcoloid, highly efficient stabilizer, prevents body separation and markedly increases shelf life. Kelcoloid promotes a uniform, smooth consistency giving dressings a highly desirable, palatable appearance.

No Surer Way to Achieve Effective Emulsion Stability

KELCOLOID HVF, the high viscosity member of this series, is generally recommended for use where a decided increase in viscosity is desired along with effective emulsion stability.

KELCOLOID LVF, the low viscosity member of this algin series, produces excellent emulsion stability and desirable body qualities. The LVF is recommended for use where a high degree of emulsion stability is desired with a minimum change in viscosity and body properties.

YOURS ON REQUEST: Free samples of KELCOLOID and other Kelco algin products, plus Technical Data describing properties, advantages and uses. At your service, too, are highly qualified food technicians ready to give individual attention to your problems. Write without obligation to your nearest Kelco regional office.

Kelcoloid HVF® Kelcoloid LVF® products of Kelco Company

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Cable Address: KELCOALGIN — CLARKNEWJERSEY

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Griffith's laboratory-controlled products and kitchen-tested formulas are available for . . .

BREADED FOODS

- ☐ Breaded Beef Steaks
- ☐ Breaded Pork Chops
- ☐ Breaded Veal Steaks
- ☐ Breaded Shrimp
- ☐ Fish Sticks
- ☐ Turkey Sticks

MEAT DISHES

- ☐ Bar B-Q Beef
- ☐ Barbecue Short Ribs
- ☐ Beef (sliced) in Barbecue Sauce
- ☐ Beef Pot Pie
- ☐ Beef Stew
- ☐ Breaded Beef Steaks
- ☐ Breaded Pork Chops
- ☐ Breaded Veal Steaks
- ☐ Brown Gravy with Sliced Beef
- ☐ Chili Con Carne
- ☐ Creamed Chipped Beef
- ☐ Creamed Chipped Pork
- ☐ Dog and Cat Food
- ☐ Ham a la King
- ☐ Lamb Stew
- ☐ Mincemeat
- ☐ Mock Chicken Legs
- ☐ Sausage
- ☐ Spaghetti Meat Balls
- ☐ Spaghetti Meat Sauce
- ☐ Wieners

POULTRY DISHES

- ☐ Chicken a la King
- ☐ Chickenburgers
- ☐ Chicken Pot Pie
- ☐ Turkey Pot Pie
- ☐ Turkey Sticks

FISH & SEA FOODS

- ☐ Breaded Shrimp
- ☐ Fish Sticks
- ☐ Shrimp Cocktail in Sauce

PIES (DESSERTS)

- ☐ Apple
- ☐ Cream
- ☐ Mince
- ☐ Pumpkin

BAKED GOODS

- ☐ Cookies
- ☐ Coffee Cakes
- ☐ Pies
- ☐ Doughnut Sugar

MISCELLANEOUS

- ☐ Baked Beans
- ☐ Barbecue Sauces
- ☐ Chili Con Carne
- ☐ Chow Mein
- ☐ Chop Suey
- ☐ Fresh Tamales
- ☐ Italian Sauces
- ☐ Mushroom Sauce
- ☐ Ravioli
- ☐ Soups (all types)
- ☐ Worcestershire Sauce

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SPICES AND SEASONINGS (Purified GROUND, or SOLUBLIZED), BATTERS AND BREADINGS, BINDERS, MEAT SAUCES, MEAT CURES, MEAT TENDERIZERS, ONION AND GARLIC POWDERS, FLAVORING EMULSIONS, MONO SODIUM GLUTAMATE AND HYDROLYZED VEGETABLE PROTEINS, BACTERICIDES AND CLEANSERS.

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The MINCE MASTER Makes Catsup of

- BETTER FLAVOR
- BETTER COLOR
- SMOOTHER TASTE
- SHORTER COOK

"No machine matches it in breaking tomato cells into minute particles, releasing practically all the pectins . . ."

Capacity 28-hp model 28 tons tomatoes per hour, using .045 screen in Pulper and .020 screen-plate in the MINCE MASTER

Griffith

The Griffith Laboratories, Inc.

1415 W. 37th St., Chicago 9

Union, N. J.

Los Angeles 58

ingredients

Sodium thiosulfate, 0.1 per cent, in salt.
Sodium tripolyphosphate
Stearyl citrate, 0.15 per cent
Tartaric acid

Stabilizers

*Acacia (gum arabic)
Agar-agar
*Ammonium alginate
*Calcium alginate
Carob bean gum (locust bean gum)
Chondrus extract (carrageenin)
*Ghatti gum
Guar gum
*Potassium alginate
*Sodium alginate
*Sterculia gum (karaya gum)
*Tragacanth (gum tragacanth)

Miscellaneous and/or general purpose food additives

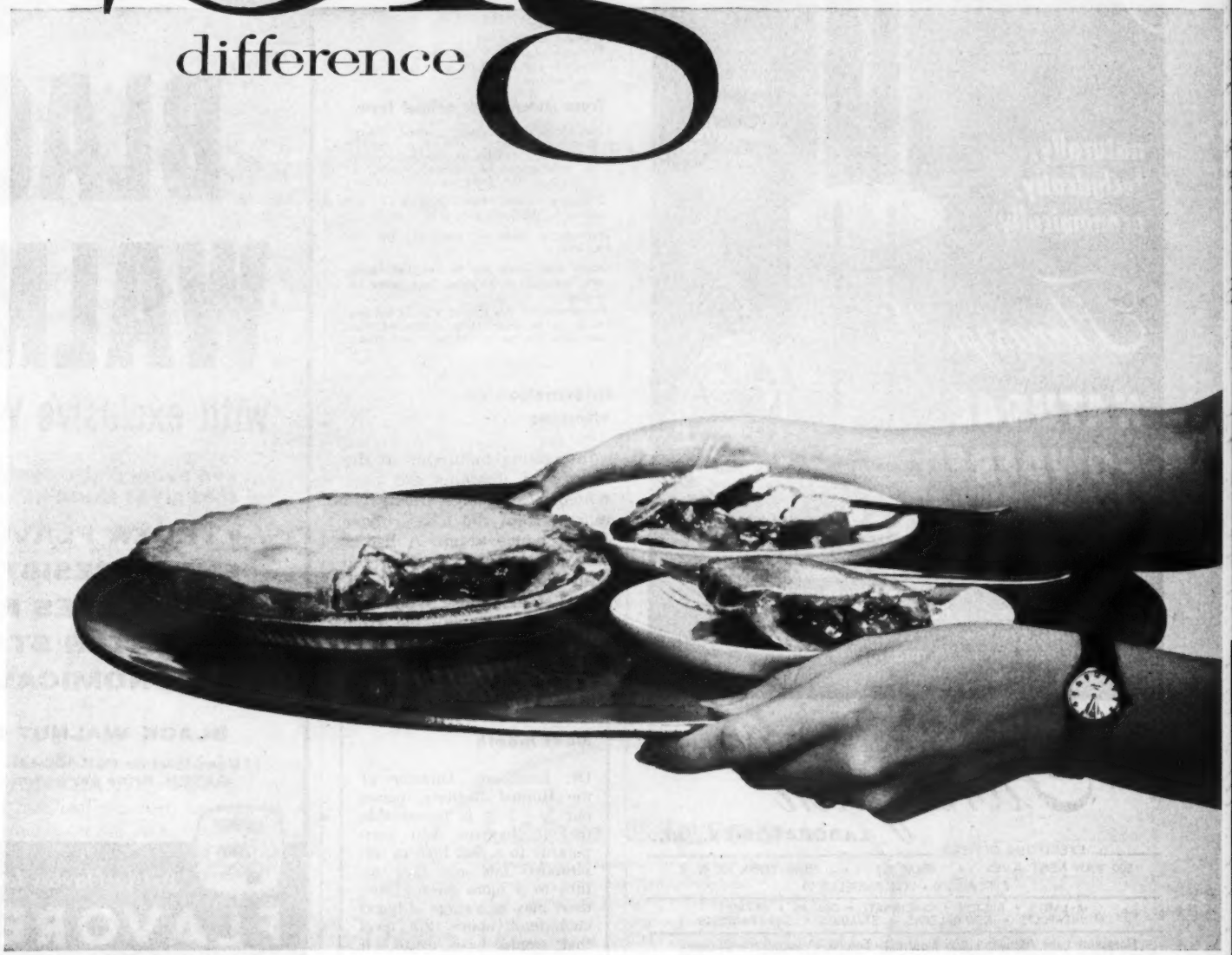
Acetic acid
*Adipic acid, buffer and neutralizing agent.
Aluminum ammonium sulfate
Aluminum potassium sulfate
Aluminum sodium sulfate
Aluminum sulfate
Ammonium bicarbonate
Ammonium carbonate
Ammonium hydroxide
Ammonium phosphate (mono- and di-basic).
*Ammonium sulfate
*Beeswax (yellow wax)
*Beeswax, bleached (white wax)
*Bentonite
Butane
Caffeine, 0.02 per cent, in cola-type beverages.
Calcium carbonate
Calcium chloride
Calcium citrate
Calcium gluconate
Calcium hydroxide
Calcium lactate
Calcium oxide
Calcium phosphate (mono-, di-, tri-basic)
Caramel
Carbon dioxide
Carnauba wax
Citric acid
*Dextrans (of average molecular weight below 100,000) Ethyl formate, 0.0015 per cent, as fumigant for cashew nuts
*Glutamic acid, salt substitute
*Glutamic acid hydrochloride, salt substitute
Glycerin
Glyceryl monostearate
Helium
*Hydrochloric acid, buffer and neutralizine agent.
*Hydrogen peroxide, bleaching agent.
Lactic acid
*Lecithin
Magnesium carbonate
Magnesium hydroxide
Magnesium oxide
Magnesium stearate, as migratory substance from packaging materials when used as a stablizer
*Malic acid
*Methylcellulose (U.S.P. methyl-cellulose, except that the methoxy content shall not be less than 27.5 per cent and not more than 31.5 per cent on a dry-weight basis).
Monoammonium glutamate
*Monopotassium glutamate
Nitrogen
*Nitrous oxide, propellant for certain dairy and vegetable-fat toppings in pressurized containers.
Papain
Phosphoric acid
Potassium acid tartrate
Potassium bicarbonate
Potassium carbonate
Potassium citrate
Potassium hydroxide
*Potassium sulfate
Propane
Propylene glycol
*Rennet (rennin)

a little cmc makes a big difference

Processors of frozen fruit pies find that a little Hercules Cellulose Gum, purified CMC, in the fillings makes a big difference. Hercules Cellulose Gum is used in these items, such as this cherry pie, because it makes it easier to control viscosity and gives the pies freeze-thaw stability. At the same time, cellulose gum combined with the starch thickens juices to the proper consistency for handling and eating; prevents floating or settling of the fruit; and contributes to more desirable gel texture. The filling will be clearer and brighter and show the fruit to best advantage.

For better frozen pies and constant formulations next time try a little cellulose gum. It makes a big difference.

For details write to Hercules.

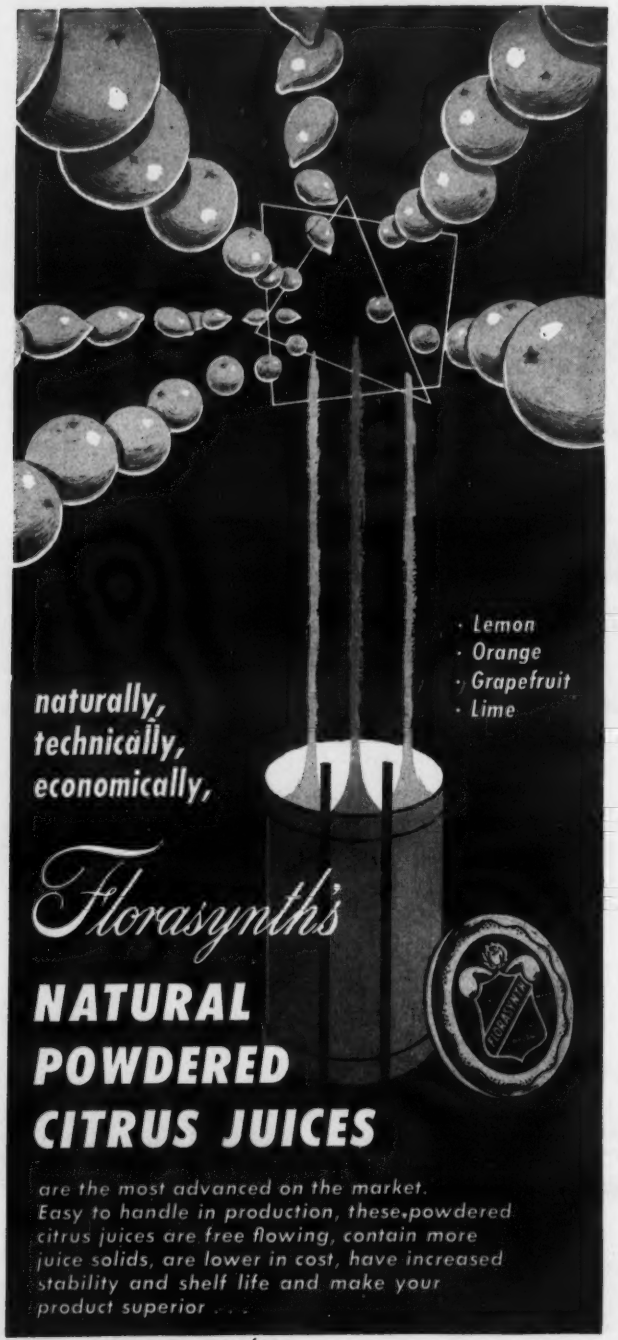


For more information on product at right, circle 6554 see information request blank opposite last page.

Hercules® Cellulose Gum

VC61-2

HERCULES POWDER COMPANY
INCORPORATED
Hercules Tower, 910 Market Street, Wilmington 99, Delaware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· Orange
· Grapefruit
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technically,
economically,
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are the most advanced on the market.
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Sales Offices in Principal Foreign Countries
At New York IFT meeting (May 7-10), stop at Florasynth's booths #9, 10

6555 on Reader Service Slip.

ingredients

*Silica aerogel (finely powdered micocellular silica foam having a mimimum silica content of 89.5 per cent), component of anti-foaming agent.
Sodium acetate
Sodium acid pyrophosphate
Sodium aluminum phosphate
Sodium bicarbonate
Sodium carbonate
Sodium citrate
*Sodium carboxymethylcellulose (the sodium salt of carboxymethylcellulose not less than 99.5 per cent on a dry-weight basis, with maximum substitution of 0.95 carboxymethyl groups per anhydroglucose unit, and with a minimum viscosity of 25 centipoises for 2 per cent by weight aqueous solution at 25° C.)
*Sodium caseinate
Sodium citrate
Sodium hydroxide
*Sodium pectinate
Sodium phosphate (mono-, di-, tribasic)
Sodium potassium tartrate
Sodium sesquicarbonate
Sodium tripolyphosphate
*Succinic acid
Sulfuric acid
Tartaric acid
Triacetin (glyceryl triacetate)
Triethyl citrate, 0.25 per cent, dried egg whites.

Trace minerals for animal feeds

Forty-six salts of cobalt, copper, iodine, iron, manganese, and zinc (cobalt limited to 0.0001% in the daily ration of non-ruminants; copper limited to 0.001% in the daily ration of sheep)†

*Substances added from February 2 and August 4, 1960, proposed lists.

†Approved as GRAS in Federal Register, Feb. 18, 1961

[1]Amino acids listed may be free, hyrochloride salt, hydrated, or anhydrous form, where applicable.

[2]For purposes of this list, no attempt has been made to designate those sequestrants that may also function as chemical preservatives.

Information on vitamins

Interesting highlights in the history of vitamins are presented in an 8 page, illustrated reprint from the Chas. Pfizer & Co. house organ. A list of essential vitamins is provided with commentary about each.

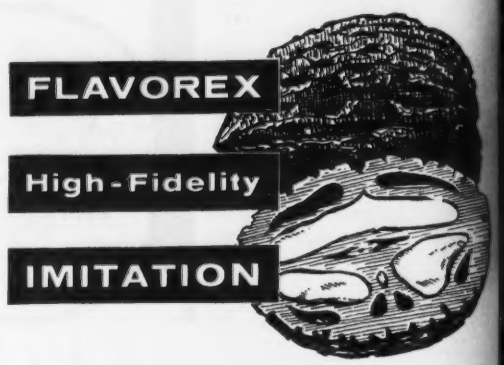
Copies of "Those Wonderful Vitamins" are available from the Chas. Pfizer & Co.

6556 on Reader Service Slip.

Next month

Dr. Lundberg, Director of the Hormel Institute, points out ". . . it is conceivable that, if humans shift temporarily to a diet high in unsaturated fats and then return to a more normal diet, there may be a surge of blood cholesterol above the level that would have existed if the individual had remained on a normal type of diet throughout."

New finer flavor improves sales!



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with exclusive Walnadyne

--a synergistic compound that gives these advantages--

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- HEAT RESISTANT
- DISPERSES READILY
- GREATER STABILITY
- ECONOMICAL

BLACK WALNUT NO. 2047
Used ½—1 oz PER 100 LB. BATCH. Price per gallon $12.50

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ide variety of food products enjoy increased appetite appeal seasoned with Bakon Yeast.

Exciting New Smoked Flavor for foods

Food products, plain or seasoned, get a zestful flavor boost with hickory-smoked Bakon® Yeast. Tasty Bakon is a U.S.P. Dried Torula Yeast, salt free, and genuinely smoked for an authentic bacon-like flavor. It carries 50% protein and the entire vitamin B complex. Bakon is stable and uniform. It contains no starch, sugar or meat. Discover for yourself why many important food firms now incorporate hickory-smoked Bakon Yeast into their products.

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Manufacturer and distributor of Bakon Yeast

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*American Pub. Health Assoc., Oct. 15, 1954

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technical literature Classified Listing

- **Equipment**
- **Ingredients**
- **Supplies**

Starred* items below have been more extensively reviewed elsewhere in the magazine. Key numbers in the last line will help to locate these reviews, which are numbered in sequence. Items followed by (†) indicate literature offered by advertisers — see Advertisers Index, page 181.

Processing Equipment, Accessories

Versatile, sanitary disintegrator*, 2 pp, (Bul RP-1) Rietz Mfg. Co.
6406 on Reader Service Slip.

Multi-compartment tanks in 11 sizes*, 4 pp, (Lit) Paul Mueller Co.
6378 on Reader Service Slip.

Controlled atomization with flexible spray machines*, 4 pp, (Bul 51) Bowen Engrg. Co., Inc.
6368 on Reader Service Slip.

Outlines method for economical whey disposal*, 4 pp, (Lit) Hall & Co., Inc.
6369 on Reader Service Slip.

90 models of packaged boilers, from 15 to 600 hp*, 4 pp, (Lit) Cleaver-Brooks Company
6403 on Reader Service Slip.

Basic review of refrigeration compressors and their application*, 4 pp, (Lit) Freezing Equipment Sales, Inc.
6357 on Reader Service Slip.

A cone shaped mixer permits easy additions of molasses, fats, oils, vitamins, etc. to large batches; allows no lump formation†, (Bul) The J. H. Day Co.
6560 on Reader Service Slip.

Evaporator equipment operates without water, steam, or boiler†, (Lit) Henszey Company, Inc.
6561 on Reader Service Slip.

High-speed fluid-mixers from ½ to 3 hp that can't be overloaded†, (Bul B-521) Mixing Equipment Co.
6562 on Reader Service Slip.

Seven sizes of heavy duty packaged air compressor units that are easily and quickly installed without costly foundation work†, (Bul WB-10) Gardner-Denver Co.
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Tells how to select a new boiler to meet your processing requirements†, (Booklet) Cleaver-Brooks
6564 on Reader Service Slip.

Vibratory screen is designed to handle a full range of screening applications†, (Cat) Syntron Co.
6565 on Reader Service Slip.

Spray drying nozzles with tungsten carbide orifice combined with swirl chamber gives longer lasting service†, (Cat SD-1 and SD-2) Delavan Mfg. Co.
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Mixing propellers that eliminate vibration and shaft whip are available in sizes ranging from 3 to 72 inches†, (Cat) Michigan Wheel Co.
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Vibrating screens for fast, sanitary, low-cost cleaning and dewatering of food products†, (Book 2777) Link-Belt Co.
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Presents a line of corrosion resistant processing kettles having from 5 to 500 gallons capacity†, (Bul) Lee Metal Products Co., Inc.
6569 on Reader Service Slip.

New line of motorpumps, from 15 to 500 gpm, can be mounted in many positions, 4 pp, (Form 70287) Ingersoll-Rand
6570 on Reader Service Slip.

Rotary, sanitary pump has capacity up to 200 gpm; 100,000 lbs/hr, 2 pp, (Bul A-1-540) The Creamery Package Mfg. Co.
6571 on Reader Service Slip.

Rotary pumps and proportioning systems, 8 pp, (Bul 1) Blackmer Pump Company
6572 on Reader Service Slip.

Illustrates and describes large-capacity sifter, 4 pp, (Bul 136-A) Sprout, Waldron & Co., Inc.
6573 on Reader Service Slip.

Electric heating bands for wide variety of applications, 4 pp, (Bul BHA) Acra Electric Corp.
6574 on Reader Service Slip.

Plate heaters, coolers in many shapes and forms, 2 pp, (Data Sheet M12) Dean Products Co., Inc.
6575 on Reader Service Slip.

Thirty-four sizes of centrifugal pumps from 100 to 6400 gpm, 16 pp, (Bul 721.6) Goulds Pumps, Inc.
6576 on Reader Service Slip.

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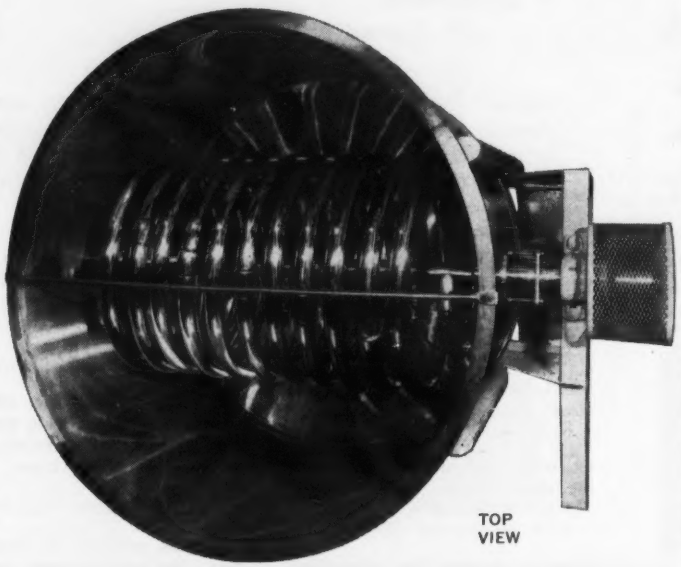
rotating action of new rotary coil prevents burn-on . . . provides uniform heat!



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new literature

Lists line of rotary and flash dryers as well as pilot-plant equipment. 16 pp, (Bul G560) Edw. Renneburg & Sons Co.
6580 on Reader Service Slip.

Describes line of size-reduction and material handling equipment, 4 pp, (Bul 102) The Young Machinery Co., Inc.
6581 on Reader Service Slip.

Ingredients, Food Additives

Reprint from suppliers publication presents interesting highlights about vitamins*, 8 pp, (Reprint — "Those Wonderful Vitamins") Chas. Pfizer & Co., Inc.
6556 on Reader Service Slip.

Applications for a pectin that gells without sugar†, (Data sheets on low calorie jams). Aspics, Fruit Jells, Relishes, Desserts, Sauces, and Others, Sunkist Growers
6582 on Reader Service Slip.

Silicone defoamers that are efficient, economic and versatile†, (Manual) Dow Chemical Corp.
6583 on Reader Service Slip.

A comprehensive catalog of food ingredients such as botanicals, gums, and resins†, (Cat) Meer Corp.
6584 on Reader Service Slip.

Latest prices of flavors, colors and citrus concentrates, 12 pp, (price list) Fritzsche Bros.
6585 on Reader Service Slip.

Information about a shortening manufactured for Danish and puff pastry, 4 pp, (Total Refining Brochure) Durkee
6586 on Reader Service Slip.

Packaging, Labeling, Cartoning

19 stories of flexible packaging applications*, 40 pp, Bartelt Engineering Co.
6426 on Reader Service Slip.

Tips on sealing shipping containers*, 8 pp, Bostitch, Inc.
6432 on Reader Service Slip.

Characteristics and applications of Olefane polypropylene film*, 8 pp, (Booklet AO-100) AviSun Corp.
6412 on Reader Service Slip.

Physical and film properties of new low-density-poly frozen food film, 3 pp, (Mat Bul No. 6) Eastman Chemical Products
6587 on Reader Service Slip.

Complete information on automatic case gluer, manual-feed case gluer and automatic compression sealer, 16 pp, (Bul 100-37A) J. L. Ferguson Co.
6588 on Reader Service Slip.

Properties and uses of most-used cellophanes*, 4 pp, DuPont
6416 on Reader Service Slip.

Bag closing machine is adjustable for a wide range of bag sizes†, (Bul No. 100) Union Special Machine Co.
6589 on Reader Service Slip.

A complete line of bag closing equipment ranging from small hand sewers to fully automated production line†, (Cat) Dave Fischbein Co.
6590 on Reader Service Slip.

New Model 432 case packer for cup-filled products, 1 p, Anderson Bros. Mfg. Co.
6591 on Reader Service Slip.

New Model 592 box former and sealer, 1 p, Anderson Bros. Mfg. Co.
6592 on Reader Service Slip.

Up-to-date summary of physical characteristics, mechanical and chemical properties, commercial applications of "Pro-fax" polypropylene, 20 pp, Hercules Powder Co., Inc.
6593 on Reader Service Slip.

Automatic, high-speed carton filler and sealer, 4 pp, Triangle Package Machinery
6594 on Reader Service Slip.

Mobile weight calculator weighs and records items on production lines, 4 pp, (Brochure) Scale Specialties
6595 on Reader Service Slip.

Bulk Handling and Accessories

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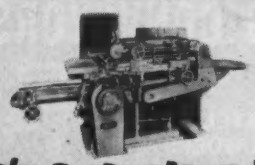

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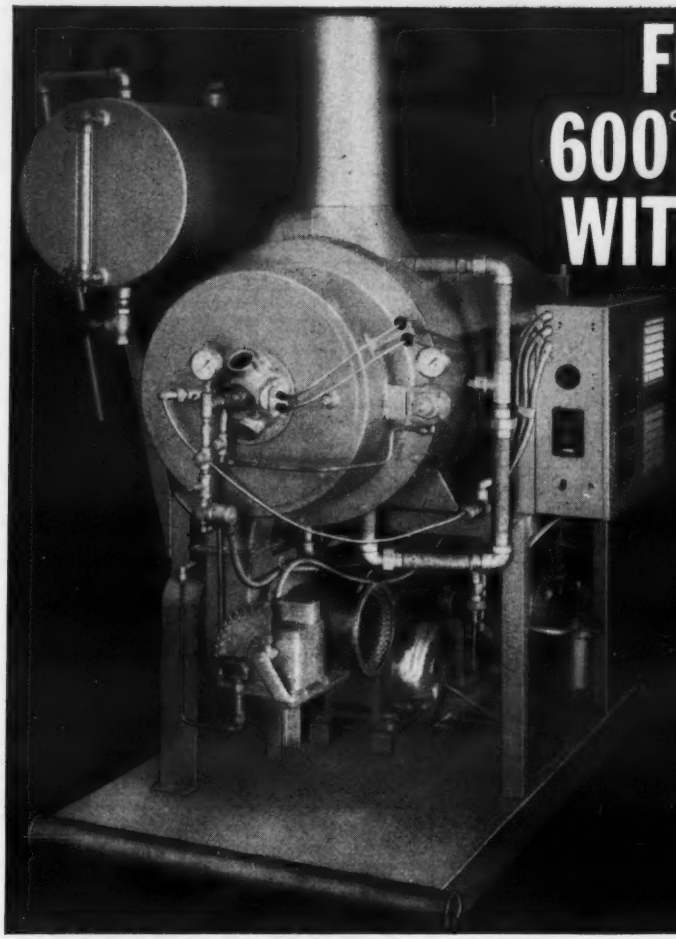

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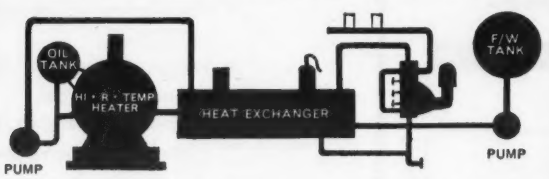

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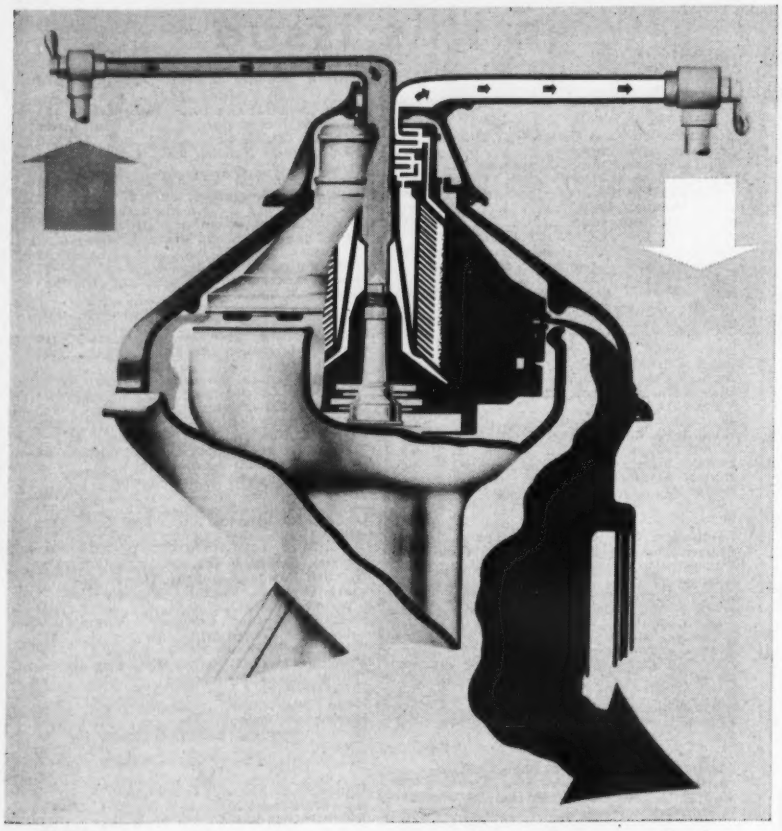

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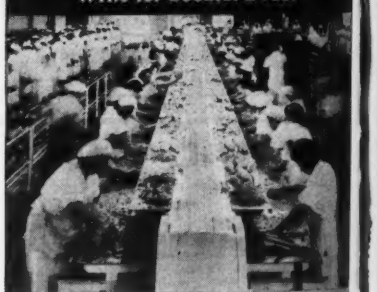

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